

MONTGOMERY COUNTY AQUATIC INVENTORY

(and some in Randolph Co.)

by

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n=21

1999-2000

Barnes Creek, SR 1134, Montgomery

Barnes Cr, SR 1306

"

Bridges Cr, SR 1519

Cedar Cr, SR 1150

Cheek Cr, SR 1541

Densons Cr, NC 134

Densons Cr, SR 1323

Doomas Cr, SR 1310

Lick Fk, SR 1129

L. Hamer Cr, SR 1115

Little R, SR 1340

Little R, SR 1554

Mountain Cr, SR 1533

Poison Fk, SR 1306

Rocky Cr, SR 1543

Town Cr, SR 1542

Tr. b. to Barnes Cr, SR 1303

Uwharrie R, SR 1301

W. Fk. Little R, SR 1311

Wood Run Cr, SR 1150

↓

Little R, SR 1127, Randolph

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MONTGOMERY COUNTY AQUATIC INVENTORY

Introduction

Montgomery County is located in the lower Piedmont Plateau of North Carolina, just north of the Sandhills region. The county lies mostly within the Yadkin-Pee Dee River Basin and a small portion along the eastern border drains into the Lumber River Basin. The Yadkin-Pee Dee River Basin drains from above the Virginia border into South Carolina, crossing the three physiographic regions of North Carolina -- the Appalachian Mountain Province, the Piedmont Plateau, and the Coastal Plain. This watershed contains 5,855 miles of streams and drains 7,221 square miles, making it the second largest drainage basin in the state. The Lumber River Basin originates in North Carolina along the Montgomery-Moore county line and drains southeast into Columbus and Bladen counties. This watershed has 2,283 miles of streams and encompasses 3,335 square miles of land. The river basin extends into South Carolina as well, where the Lumber River eventually joins the Great Pee Dee River. The Lumber River Basin is predominantly a blackwater system with acidic waterways and an abundance of cypress trees. Much of the Lumber River mainstem has been designated as a State Natural and Scenic River, with 115 river miles flowing through the Lumber River State Park.

Montgomery County lies in the Uwharrie Mountains, the oldest mountain range in North America. The Uwharries emerged around 500 million years ago and had 20,000-feet summits that have been eroded through time to their current height of under 1,000 feet. Much of the range is now protected as the Uwharrie National Forest. Prior to its designation as a national forest, the land was cleared for timber and farming, leaving mostly second and third-growth mixed forest stands today. The primary uses of this important natural resources area include timber production, hunting, fishing, hiking, camping, swimming, boating, canoeing, horse riding, biking, off-road vehicle use, and even gold panning. In fact, the country's first gold rush (1799) occurred in the Uwharries. The forest also boasts more archaeological sites per acre than any other southeastern forest. Town Creek Indian Mound, located on the Montgomery-Richmond county line, is a reconstructed ceremonial center created by the Creek Indians, who occupied the area from around 1250 to 1450. The County Seat is in Troy, the largest town. Other nearby features and cultural attractions include Lakes Badin and Tillery, Morrow Mountain State Park, the North Carolina Zoo, and Seagrove Potteries.

The objective of this project was to survey Montgomery County for aquatic species, including freshwater mussels, sphaeriid clams, aquatic snails, crayfishes, and fishes. Our goals were to determine species presence, distribution, relative abundance, and relative health. Figure 1 and Table 1 detail the localities of all sites surveyed. Almost all of the streams surveyed were riffle/run/pool sequences, but some had only run or slack water. Depth varied from very shallow to moderate, and widths ranged from 1 to 15 m, with the exceptions of the Little River (20-30 m) and Denson's Creek (10-40 m). Percent cover over streams was greater than 50% for almost ¾ of streams surveyed. Stream substrate consisted of varying amounts of silt, cobble, pebble, gravel, boulder, clay, and sand. Bank height was generally between 1 and 2 m, with some reaching 3 m, and banks were mostly stable with some undercutting. Buffer widths were moderate to wide, and riparian vegetation consisted of mostly trees and shrub-brush with some grass. Only a few streams had unstable banks, and narrow or no buffers. Woodland area

surrounding streams was generally intermediate or extensive with none or low amounts of windthrow. Approximately 67% of surrounding area was natural, with about 43% being used for timber, and only a few scattered rural houses or crop fields. The following sections provide results of the aquatic inventory for each of the taxa mentioned above.

Acknowledgements

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 Nongame and Endangered Wildlife Program

Methods

We used county maps and the North Carolina Atlas and Gazetteer to locate bridge crossings that would serve as sample sites. A total of 23 sites were surveyed for this study (Table 1, Figure 1). Visual estimates of substrate composition, average stream width, average depth, bank height and stability, width and composition of the riparian buffer were recorded at each site. Map locations in latitude/longitude were acquired using Garmin 12 XL Global Positioning System units. Both bivalve and gastropod mollusks were observed or collected during visual and tactile searches of the streambed. Gastropod mollusks were also observed or collected during visual and tactile searches of aluminum cans, bottles, and other anthropogenic materials, woody debris, leaf packets, and aquatic plants. Live freshwater mussels were identified, measured, and returned to the stream. Shell material was retained if in suitable condition for museum collections. The presence or absence of *Corbicula fluminea* was noted and pea and fingernail clams were preserved in ethyl alcohol for later identification. Crayfish and fish were collected by dipnet and/or using a backpack electroshock unit. Specimens that could not be identified in the field were preserved in 70% to 90% ethyl alcohol for later identification.

Aquatic Snails and Clams

Over 9 days from 23 August 1999 to 6 July 2000, 22 of 23 sites were surveyed (Site 5 was only surveyed for crayfish and fish and was excluded from the results reported herein) and aquatic snails were collected or observed at 17 localities (Table 2). Nine species representing 7 families were documented during the Montgomery County aquatic inventory: *Campeloma decisum* (pointed campeloma), *Elimia catenaria* (gravel elimia), *Elimia proxima* (sprite elimia), *Ferrissia* sp., *Helisoma anceps* (two-ridge rams-horn), *Micromenetus dilatatus* (bugle sprite), *Physella* sp. (physa snail), *Pseudosuccinea columella* (mimic lymnaea), and *Somatogyrus* sp. (pebblesnail). No one species dominated the waterways, but *Ferrissia* sp. was the most common and widespread gastropod, residing at 14 sites. Due to species level variation and the uncertainty of positively discerning *Ferrissia* specimens, all specimens of this genus were identified as *Ferrissia* sp. Other common species included *H. anceps*, *Physella* sp. and *E. catenaria*, residing at 10, 9, and 9 sites respectively. These species were typically common to abundant when collected. The remaining snail species were represented at a smaller number of sites, ranging from 1-6, where they were mostly common to rare. The exception was *E. proxima*, which was usually abundant. Recent reproduction was seen at a number of sites for most of the snail species collected during the survey, but it was definitely more pronounced amongst the *Elimia* species and *Ferrissia* sp. Due to the minute size of some of the species (e.g., *Micromenetus dilatatus* and *Somatogyrus* sp.), it was difficult to confirm whether these were adults or juveniles and typically reproduction was not recorded.

Over the same time period and at the same sites, 3 species of sphaeriid clams, *Sphaerium striatinum* (striated fingernailclam), *Pisidium casertanum* (ubiquitous peaclam), and *Corbicula fluminea* (Asian clam), were collected or observed at 12 localities (Table 2). Of these 12 localities, the Asian clam was present at 11 sites and was the only clam

present at 5 of these sites. The striated fingernailclam was present at 2 sites along with *C. fluminea*, while the ubiquitous peaclam was individually present at a single site. Sphaeriid clams were observed at the remaining 4 sites with the Asian clam but no specimens were preserved for identification. *Corbicula fluminea* tended to be uncommon to common when collected and reproduction was evident at most sites. Unlike the Asian clam, the true sphaeriids were uncommon to rare when collected and reproduction was not typically noticed.

Overall, the diversity and abundance of freshwater snails in the waterways associated with Montgomery County is moderate. The number of species is relatively high, but the distribution and abundance of these species is comparatively low. In comparison to the Uwharrie Mountains inventory (Alderman and McGrath 1994), our survey represents an accurate and relatively unchanged catalog of the aquatic snail fauna. During the Uwharrie Mountains inventory, 11 snail species representing 7 families were collected, 7 species of which we collected during our survey. The two remaining species that we collected (*Ferrissia* sp. and *Somatogyrus* sp.), but weren't identified in the Uwharrie Mountains survey, may have actually been collected during that previous survey. Ancylids and hydrobiids were collected but identified as different species. Given the difficulty in sometimes identifying species from these families, it is possible that the same species were collected but identified differently.

Unlike the snail fauna, we collected only 3 species of sphaeriid clams, including *Corbicula fluminea*. During the Uwharrie Mountains inventory (Alderman and McGrath 1994), 4 sphaeriid clam species were collected, 2 of which overlapped with our survey: *Corbicula fluminea* and *Sphaerium striatinum*. Given the total number of species between the 2 inventories, this represents a relatively typical number of clam species for a given area compared to what the author has experienced during numerous other aquatic surveys. However, with the exception of the Asian clam, all species were collected from a low number of sites (a single site in the case of 3 species). Given the lack of quantitative sampling during both of the surveys, it is unknown whether this low number of sites represents the actual population levels of these species, a decrease, or an underestimate due to sampling intensity.

The influence of geomorphologic and topographic factors has most likely structured the current gastropod and sphaeriid fauna of the area. Major landscape scale factors such as these are known to influence and impact the distribution and abundance of organisms over time. While water chemistry parameters were not measured at the surveyed sites, cumulative impacts from poor land uses could be affecting the quality of the waterways. The presence of agriculture and logging operations within close proximity to some of the surveyed water bodies has most likely had a negative impact on stream quality through animal waste infiltration and sedimentation, respectively. While these impacts may not have had a significant effect on the current aquatic snail and clam diversity, they are likely affecting the current abundance and distribution of each species. Effects from urbanization are likely present but should be minimal, as Troy is the largest city located in Montgomery County.

Taxonomic uncertainties within the freshwater snail fauna make the results here subject to revision. For example, the differentiation between *F. rivularis* and *F. fragilis* is difficult due to shell shape variation. Therefore, a common factor used to distinguish these species is the habitat they are collected in, with *F. rivularis* colonizing rivers and streams and *F. fragilis* inhabiting stagnant areas such as ditches, ponds, and backwater areas. All of the limpets identified in this survey were assigned to *Ferrissia* sp., but it is likely that at least both species inhabit some of the sites that were surveyed, with *F. rivularis* more dominant in the region. Likewise, there is uncertainty with the taxonomic assignments within the *Elimia* genera (Burch 1989). At this time, it is not definitely known if *Elimia proxima* and *E. symmetrica* are 2 distinct species, or a single, highly variable species. Typically, the specimens we collected have been identified as *E. proxima* but it is thought that this species may be limited to the Tennessee River Basin (A.E. Bogan, North Carolina State Museum of Natural Sciences, Aquatic Invertebrate Curator, pers. comm.) within North Carolina. For purposes of this report, we have chosen to use *Elimia proxima* to classify these specimens. Likewise, many uncertainties exist as to the taxonomy of *Physella* and hydrobiids without examination of soft parts (Burch 1989). Since we did not preserve the specimens for the examination of soft parts, we identified these specimens to genus only.

No rare or significant snail or pea clam species was found during the Montgomery County aquatic inventory. However, much more research and status surveys are needed to determine which species are significant or rare on a statewide basis. Current land management practices, including agriculture and urbanization, are having an effect on the snail and pea clam fauna in North Carolina. As nongame biologists, we need to identify which species are at risk and identify ways to reduce or eliminate impacts.

Freshwater Mussels

A total of twelve native freshwater mussel species were observed during 1999-2000 aquatic surveys of Montgomery County. Four of the species observed are designated State Threatened: *Alasmidonta varicosa*, *Fusconaia masoni*, *Lampsilis cariosa*, and *Strophitus undulatus* (Figure 2). *Lampsilis radiata conspicua** and *Villosa vaughaniana* are designated as State Special Concern species (Figure 3) and two species, *Villosa constricta* and *Villosa delumbis*, are designated Significantly Rare by the NC Natural Heritage Program (Figure 4). *Uniomerus* sp., status undetermined, was also observed in these surveys. Three elliptio species were found including *Elliptio complanata* complex, *E. icterina* complex, and a lanceolate elliptio, *Elliptio angustata*. The conservation status of these elliptio species is undetermined at this time, primarily due to taxonomic uncertainty within the genus.

Elliptio complanata complex (also recorded as *Elliptio* spp.), was the most commonly encountered mussel being found in 13 streams (Table 3): Barnes Creek, Bridger's Creek, Cheek Creek, Denson's Creek (2 sites), Doomas Creek, Lick Fork, Little River (3 sites), Mountain Creek, Poison Fork, Rocky Creek, Town Creek, Uwharrie River, and West Fork Little River. *Elliptio icterina* was recorded at only one site, Little River at SR 1323,

* Effective July 1, 2002.

however, individuals belonging to this species were likely included with the umbrella "*Elliptio spp.*" records. *Villosa delumbis* and *V. vaughaniana*, the next most common species, co-occurred in 7 streams: Barnes Creek, Bridger's Creek, Denson's Creek, Doomas Creek, Lick Fork, Little River, and West Fork Little River. *V. delumbis* was also found in Rocky Creek, and *V. vaughaniana* was found in Uwharrie River. *Elliptio angustata* was found in 8 streams: Barnes Creek, Cheek Creek, Denson's Creek, Little River, Rocky Creek, Town Creek, Uwharrie River, and West Fork Little River. *Villosa constricta* and *Alasmidonta varicosa* were observed in Barnes Creek, Denson's Creek, and Little River. *V. constricta* was also found in the West Fork Little River. *Lampsilis radiata conspicua* was found in 2 streams: Little River and Uwharrie River. The remaining species, *Fusconaia masoni*, *Lampsilis cariosa*, *Strophitus undulatus*, and *Uniomerus sp.* and were only found in the Little River.

The number of mussel species observed indicates a good diversity, particularly of rare species. Freshwater mussels were also well distributed throughout the county, being found in 13 of 18 streams surveyed. The most diverse mussel fauna was observed in the Little River with 12 species. NCWRC surveys of the Little River conducted in 1995 and 1997 turned up two additional species, *Pyganodon cataracta* and *Utterbackia imbecillis* (Table 4). Both of these species are relatively common and are well adapted to impounded conditions. Their absence from the current surveys is most likely an artifact of sampling, we did not survey within any impounded reaches. A third species, *Alasmidonta undulata*, was found in the Little River during the Uwharrie Mountains inventory (Alderman and McGrath 1994). This, the only known population of the triangle floater within the Pee-Dee River Basin in North and South Carolina, was considered near extirpation at that time (Alderman and McGrath 1994). It appears that, although this species may still exist within the Little River subbasin, its numbers have declined below detection level and it may be extirpated from the Pee-Dee River Drainage altogether. The Little River population of *Fusconaia masoni* is also in serious decline. In 1994, this population was described as of fair quality when compared to other populations in the state and the best population of the species within the Pee-Dee drainage in North Carolina. Animals were found at four stations in the Little River Basin, two in Randolph County and two in Montgomery County. We have not observed *Fusconaia masoni* in Little River proper within Montgomery County since 1994. A single individual was recorded from the Little River, Randolph County in the current survey and NC Department of Transportation biologist have documented the species from the Little River, Randolph County as recently as September 2000 (T. Savidge, pers. comm.)

Denson's Creek continues to support the second most diverse mussel fauna in Montgomery County with 8 species; however, we did not find *Toxolasma pullus* in the current surveys. This species was found in Denson's Creek during the Uwharrie Mountains inventory (Alderman and McGrath 1994) and more recently in surveys conducted in 1995 and 1997 (Table 4). Its absence from 1999-2000 surveys suggests that this species is in decline within this subbasin and illustrates the vulnerability of this population to extirpation.

The recent declines observed among the freshwater mussel populations of Montgomery County are particularly disturbing because there are no clear causes. A considerable portion of the land within the county boundaries is managed as a national forest and private individuals maintain much of the remainder in silviculture. Textile manufacturing is the only other major industry in the county. Protection of riparian areas through the maintenance of wide forested buffers, limits on number and composition of point source discharges, and appropriate limits on water withdrawals from surface waters can improve water quality and habitat conditions for all aquatic species and may help to reverse the decline of rare species.

Crayfishes

The overall diversity of crayfishes in this system was low, containing at least 2 species collected during our inventory: *Cambarus (Puncticambarus)* sp. nov. (a member of a species complex related to *C. (P.) acuminatus* Faxon, 1884 that is currently being described by J.E. Cooper, NC State Museum of Natural Sciences), and *Procambarus (Ortmannicus) acutus* (Girard, 1852). The conservation status of the first is undetermined, and the latter is considered stable throughout its range.

Cambarus sp. nov. and *P. acutus* were well distributed throughout the surveyed areas, occurring at 20 and 16 sites, respectively (Table 2). Both species ranged in abundance from rare to abundant, but were common at most sites. *Cambarus* sp. nov. was the only species collected at 5 sites, and *P. acutus* was collected alone at 2 sites. No crayfish were collected at 1 site. Recent reproduction was evident for both species. *Cambarus* sp. nov. ranged in size from 11 to 30.5 mm carapace length with a mean length of 20.0 ± 5.1 mm. *Procambarus acutus* ranged in size from 7 to 41 mm carapace length with a mean length of 23.1 ± 12.3 mm. The identity of specimens (currently assigned to *C.* sp. nov.) observed at sites 000705.1, 000705.2, and 000705.3 may be one or both of the following: (1) *Cambarus (C.)* sp. A (which may be conspecific with *C. (C.) howardi* Hobbs and Hall, 1969), a species that is proposed by the Scientific Council of Freshwater and Terrestrial Crustaceans to be put on a watch list, and (2) another member of the *C. (P.)* sp. C complex of which *C.* sp. nov. is a part. Because these specimens were not preserved for identification, we cannot confirm their identity.

During our survey, we found 2 of the 10 native species historically known to occur in the Yadkin-Pee Dee River Basin. Eight species that we did not (conclusively) find, but that occur in this river basin, are *Cambarus (C.) bartonii* (Fabricius, 1798), *C. (C.)* sp. A, *C. (Depressicambarus) catagius* Hobbs and Perkins, 1967, *C. (D.) reduncus* Hobbs, 1956, *C. (Hiaticambarus) longulus* Girard, 1852, *C. (Jugicambarus) asperimanus* Faxon, 1914, and *C. (J.) dubius* Faxon, 1884, and other members of the *C. (P.)* sp. C complex. Four of these species occur in the headwaters of this river basin, and are not known to occur in the area where our survey was conducted. Two species, *C. catagius* and *C. reduncus*, are burrowing species and have been collected from the area (McGrath 1994). However, our survey did not use methods designed to find burrowers. This inventory has helped to establish the continued presence and further clarify distribution boundaries of several species, including a newly discovered species, in the Yadkin-Pee Dee River Basin.

Freshwater Fishes

Over 9 days from 23 August 1999 to 6 July 2000, 23 sites were surveyed and fish were collected or observed at all 23 localities (Table 2). Thirty-nine species representing 8 families were documented during the Montgomery County aquatic inventory (Table 5). Of the 66 species that have been documented in Montgomery County (Menhinick 1991), we confirmed the presence of 38 of these species. Limitations as to our access of all available habitats and sampling range within the county were the most likely reasons for the absence of particular species. However, we did document the presence of 1 species that was not previously documented from Montgomery County: *Micropterus dolomieu* [STOCKED NO ✓]

Since not all specimens were preserved for laboratory or museum identification, we have chosen to classify all of the *Moxostoma* and *Scartomyzon* records that were field identified as either of the genera. The sp. designate after *Scartomyzon* refers to the brassy jumprock, and after *Moxostoma* indicates the v-lip redhorse but still recognizes the potential for other redhorse species. The first species designate is most likely the correct identification based on our initial identifications and current distributions. [X]

The waterways of Montgomery County contain a moderate diversity and distribution of fish species. While some of the fish species were collected at isolated locations (e.g., *Gambusia holbrookii*, *Cyprinella analostana*, and *Notemigonus crysoleucas*), the majority tended to occur over a moderate to broad area. The species abundance tended to vary among sites, with cyprinids comprising the majority of the biomass at most of the sites. Likewise, catostomids and sunfish dominated a number of sites. The moderate distribution and abundance of a majority of the species has probably been aided by the relative lack of impacts on the waterways in the area. Overall, the area we surveyed was mostly rural and undeveloped, minimizing the effects of agriculture and urbanization. Comparisons to other inventories of the county are limited due to the lack of recent surveys. However, our comparisons to Menhinick (1991) reflect that the species composition reported herein is representative of the area.

The collection of *Micropterus dolomieu* is the first documented locality of this species in Montgomery County according to Menhinick (1991). The smallmouth bass has been previously documented from a number of localities in the northern portion of the Yadkin-Pee Dee River Basin and throughout western North Carolina. Likewise, *Acantharchus pomotis* had never been collected from the Yadkin-Pee Dee River Basin portion of Montgomery County (Menhinick 1991). The mud sunfish is typically associated with the coastal plain and only 3 records had been previously documented from the Yadkin-Pee Dee River Basin. Therefore, the collection of *M. dolomieu* and *A. pomotis* in Montgomery County is a significant range extension for both species. [STOCKED NO ✓]

Significant species found during the survey included *Etheostoma mariae* (pinewoods darter). A single specimen of *E. mariae* was collected from 1 site on Naked Creek. This individual was collected from an area with run-like flow, predominantly sand substrata, and minimal debris. Currently, the pinewoods darter is listed as a species of special

concern within North Carolina. Therefore, the continued documentation of this species is significant in regards to its current status and conservation strategies.

While no additional threatened or endangered fish species was collected during the survey of Montgomery County, continual research and status surveys are needed to determine the present status of each species. Current land management practices, including agriculture and urbanization, are having an effect on the fish fauna in North Carolina. As nongame biologists, we need to identify, which species are at risk and identify ways to reduce or eliminate the impacts.

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Table 1. Map numbers and corresponding sites surveyed for the Montgomery County aquatic inventory (see Figure 1). Historical surveyed sites that were revisited during this survey are included in parentheses. Other historical sites shown on the map are not numbered.

<u>Map #</u>	<u>Site No.</u>	<u>Waterway</u>	<u>Road</u>
1	990824.1jma	W Fork Little River	SR 1311
2	000601.3jaj, 000705.1jaj	Uwharrie River	SR 1301
3	000615.2jaj, 000705.4jaj (950925.1jma)	Barnes Creek	SR 1134
4	000615.4jaj, 000705.2jaj	Poison Fork	SR 1306
5	000705.3jaj	Barnes Creek	SR 1306
6	990824.2jma (951002.3jma)	W Fork Little River	SR 1311
7	000608.4jaj, 000705.5jaj	Tributary to Barnes Creek	SR 1303
8	000608.3jaj, 000705.6jaj	Cedar Creek	SR 1150
9	000608.1jaj, 000706.5jaj	Uwharrie River	SR 1301
10	000615.1jaj, 000706.6jaj (951002.2jma)	Denson's Creek	NC 134
11	990824.4jma	Denson's Creek	NC 134
12	990823.3jma (970708.4-5jaj)	Denson's Creek	SR 1323
13	990824.3jma	Little River	SR 1340
14	000608.2jaj, 000705.7jaj	Woodrum Creek	SR 1150
15	000609.3jaj, 000705.8jaj (970708.1-3jaj)	Lick Fork	SR 1129
16	990823.1jma	Rocky Creek	SR 1543
17	990823.2jma	Little River	SR 1554
18	000615.3jaj, 000706.4jaj	Bridger's Creek	SR 1519
19	000614.1jaj, 000706.1jaj	Little Hamer Creek	SR 1115
20	990824.5jma	Town Creek	SR 1542
21	990824.6jma	Cheek Creek	SR 1541
22	000609.2jaj, 000706.2jaj	Mountain Creek	SR 1533
23	000706.3jaj	Naked Creek	SR 1527

Table 2. Clams, crayfishes, limpets, snails, and fishes found during the aquatic inventory of Montgomery County, 1999-2000.

Location	Site (date) and species	Substrate	Technique	Time	Abundance
Montgomery County					
Barnes Creek @ SR 1134					
				Search	
				Time	
				Abundance	
<u>clam</u>					
000615.2:jaj	Corbicula fluminea (Asian clam)	c,s,Sa,G,Co,bo,b	visual	4h	present
000615.2:jaj	Sphaerium striatinum (striated fingernailclam)	c,s,Sa,G,Co,bo,b	visual	4h	present
<u>crayfish</u>					
000615.2:jaj	Cambarus (Puncticambarus) sp. nov. (n/a)	c,s,Sa,G,Co,bo,b	dipnet	4h	present
000705.4:btw	Cambarus (Puncticambarus) sp. nov. (n/a)	n/a	electroshock	428s	present
000615.2:jaj	Procambarus (Ortmannicus) acutus (White River crayfish)	c,s,Sa,G,Co,bo,b	dipnet	4h	present
000705.4:btw	Procambarus (Ortmannicus) acutus (White River crayfish)	n/a	electroshock	428s	present
<u>limpet</u>					
000615.2:jaj	Ancylidae (limpet)	c,s,Sa,G,Co,bo,b	visual	4h	present
<u>snail</u>					
000615.2:jaj	Elminia catenaria (gravel elminia)	c,s,Sa,G,Co,bo,b	visual	4h	present
000615.2:jaj	Helisoma anceps (two-ridge ram's-horn)	c,s,Sa,G,Co,bo,b	visual	4h	present
<u>fish</u>					
000705.4:btw	Clinostomus funduloides (rosy-side dace)	n/a	electroshock	428s	rare
000705.4:btw	Cyprinella pyrrhomena (fieryblack shiner)	n/a	electroshock	428s	common
000705.4:btw	Etheostoma flabellare (fantail darter)	n/a	electroshock	428s	rare
000705.4:btw	Etheostoma olmstedi (tessellated darter)	n/a	electroshock	428s	rare
000705.4:btw	Hybopsis hypsinotus (highback chub)	n/a	electroshock	428s	uncommon
000705.4:btw	Lepomis auritus (redbreast sunfish)	n/a	electroshock	428s	common
000705.4:btw	Micropterus dolomieu (smallmouth bass)	n/a	electroshock	428s	common
000705.4:btw	Nothonotus leptocephalus (bluehead chub)	n/a	electroshock	428s	common
000705.4:btw	Notropis aitipinnis (highfin shiner)	n/a	electroshock	428s	common
000705.4:btw	Notropis chilictus (redlip shiner)	n/a	electroshock	428s	common
000705.4:btw	Notropis septicus (sandbar shiner)	n/a	electroshock	428s	present
000705.4:btw	Scartomyzon sp./Moxostoma sp. (redhorse sucker)	n/a	electroshock	428s	rare
Barnes Creek @ SR 1306					
<u>crayfish</u>					
000705.3:btw	Cambarus (Puncticambarus) sp. nov. (n/a)	n/a	electroshock	538s	common
000705.3:btw	Procambarus (Ortmannicus) acutus (White River crayfish)	n/a	electroshock/Visual		present

Location	Site (date) and species	Search	Substrate	Technique	Time	Abundance
Barnes Creek @ SR 1306						
<i>fish</i>						
000705.3btw	<i>Catostomus commersoni</i> (white sucker)	n/a		electroshock	538s	rare
000705.3btw	<i>Etheostoma flabellare</i> (fantail darter)	n/a		electroshock	538s	rare
000705.3btw	<i>Etheostoma olmstedi</i> (tessellated darter)	n/a		electroshock	538s	rare
000705.3btw	<i>Hybopsis hypsinotus</i> (highback chub)	n/a		electroshock	538s	uncommon
000705.3btw	<i>Lepomis auritus</i> (redbreast sunfish)	n/a		electroshock	538s	common
000705.3btw	<i>Micropodus dolomieu</i> (smallmouth bass)	n/a		electroshock	538s	rare
000705.3btw	<i>Nothonotus leptocephalus</i> (bluehead chub)	n/a		electroshock	538s	common
000705.3btw	<i>Notropis aitlinnii</i> (highfin shiner)	n/a		electroshock	538s	rare
000705.3btw	<i>Notropis chilictus</i> (redlip shiner)	n/a		electroshock	538s	common
000705.3btw	<i>Noturus insignis</i> (margined madtom)	n/a		electroshock	538s	uncommon
000705.3btw	<i>Scartomyzon</i> sp./ <i>Moxostoma</i> sp. (redhorse sucker)	n/a		electroshock	538s	common
<i>clam</i>				visual	1.7h	present
000615.3jaj	<i>Corbicula fluminea</i> (Asian clam)	s,sa,G,Co,bo				
<i>crayfish</i>						
000615.3jaj	<i>Cambarus</i> (<i>Puncticambarus</i>) sp. nov. (n/a)	s,sa,G,Co,bo		dipnet	1.7h	common
000706.4btw	<i>Cambarus</i> (<i>Puncticambarus</i>) sp. nov. (n/a)	n/a		electroshock	248s	abundant
000615.3jaj	<i>Procambarus</i> (<i>Ortmannicus</i>) <i>acutus</i> (White River crayfish)	s,sa,G,Co,bo		dipnet	1.7h	common
000706.4btw	<i>Procambarus</i> (<i>Ortmannicus</i>) <i>acutus</i> (White River crayfish)	n/a		electroshock	248s	abundant
<i>limpet</i>				visual	1.7h	present
000615.3jaj	<i>Ferrissia</i> sp. (n/a)	s,sa,G,Co,bo				
<i>snail</i>				visual	1.7h	present
000615.3jaj	<i>Helisoma anceps</i> (two-ridge ram's-horn)	s,sa,G,Co,bo				
<i>fish</i>						
000706.4btw	<i>Ameiurus platycephalus</i> (flat bullhead)	n/a		electroshock	248s	rare
000706.4btw	<i>Chaenobrytus galosus</i> (warmouth)	n/a		electroshock	248s	rare
000706.4btw	<i>Esox niger</i> (chain pickerel)	n/a		electroshock	248s	common
000706.4btw	<i>Etheostoma olmstedi</i> (tessellated darter)	n/a		electroshock	248s	uncommon
000706.4btw	<i>Lepomis auritus</i> (redbreast sunfish)	n/a		electroshock	248s	common
000706.4btw	<i>Lepomis macrochirus</i> (bluegill)	n/a		electroshock	248s	rare
000706.4btw	<i>Micropodus salmoides</i> (largemouth bass)	n/a		electroshock	248s	rare
000706.4btw	<i>Nothonotus leptocephalus</i> (bluehead chub)	n/a		electroshock	248s	uncommon
000706.4btw	<i>Notropis scepticus</i> (sandbar shiner)	n/a		electroshock	248s	rare

Location	Site (date) and species	Substrate	Technique	Search Time	Abundance
<u>Bridge's Creek @ SR 1519</u>					
<u>fish</u>					
000706.4btw	<i>Semotilus atromaculatus</i> (creek chub)	n/a	electroshock	248s	uncommon
<u>Cedar Creek @ SR 1150</u>					
<u>clam</u>					
000608.3jaj	<i>Pisidium casertanum</i> (ubiquitous peaclam)	s,sa,g,Co,Bo,B	dipnet/visual	1.3h	present
<u>crayfish</u>					
000608.3jaj	<i>Cambarus (Puncticambarus)</i> sp. nov. (n/a)	s,sa,g,Co,Bo,B	overtur rocks	1.3h	common
000705.6btw	<i>Cambarus (Puncticambarus)</i> sp. nov. (n/a)	n/a	electroshock/visual		present
000705.6btw	<i>Procambarus (Ortmannicus)</i> acutus (White River crayfish)	n/a	electroshock	219s	rare
<u>limpet</u>					
000608.3jaj	<i>Ancylidae</i> (limpet)	s,sa,g,Co,Bo,B	visual	1.3h	present
<u>snail</u>					
000608.3jaj	<i>Elminia proxima</i> (sprite elminia)	s,sa,g,Co,Bo,B	visual	1.3h	present
<u>fish</u>					
000705.6btw	<i>Aphredoderus sayanus</i> (pirate perch)	n/a	electroshock	219s	uncommon
000705.6btw	<i>Enimyzon oblongus</i> (creek chubsucker)	n/a	electroshock	219s	rare
000705.6btw	<i>Etheostoma flabellare</i> (fanail darter)	n/a	electroshock	219s	rare
000705.6btw	<i>Hybopsis hypsinotus</i> (highback chub)	n/a	electroshock	219s	rare
000705.6btw	<i>Lepomis auritus</i> (redbreast sunfish)	n/a	electroshock	219s	common
000705.6btw	<i>Lepomis gibbosus</i> (pumpkinseed)	n/a	electroshock	219s	rare
000705.6btw	<i>Nothonotus leptocephalus</i> (bluehead chub)	n/a	electroshock	219s	common
000705.6btw	<i>Notropis chilictus</i> (redlip shiner)	n/a	electroshock	219s	common
<u>Cheek Creek @ SR 1541</u>					
<u>clam</u>					
990824.6jma	<i>Corbicula fluminea</i> (Asian clam)	S, Sa, G, co, p	tactile/visual	1.25h	common
990824.6jma	<i>Sphaeriidae</i> (pea clam)	S, Sa, G, co, p	tactile/visual	1.25h	rare
<u>crayfish</u>					
990824.6jma	<i>Procambarus (Ortmannicus)</i> acutus (White River crayfish)	S, Sa, G, co, p	dipnet/electroshock	1.25h/364s	common
<u>limpet</u>					
990824.6jma	<i>Ferrisia</i> sp. (n/a)	S, Sa, G, co, p	tactile/visual	1.25h	patchy rare
<u>snail</u>					
990824.6jma	<i>Micromenetus dilatatus</i> (bulge sprite)	S, Sa, G, co, p	tactile/visual	1.25h	patchy rare
990824.6jma	<i>Physella</i> sp. (physa snail)	S, Sa, G, co, p	tactile/visual	1.25h	patchy uncommon

Location	Site (date) and species	Substrate	Technique	Time	Abundance
	Cheek Creek @ SR 1541			Search	

<u><i>fish</i></u>					
990824.6jma	<i>Clinostomus funduloides</i> (rosy-side dace)	S, Sa, G, co, p	electroshock	364s	rare
990824.6jma	<i>Etheostoma olmstedi</i> (tessellated darter)	S, Sa, G, co, p	electroshock	364s	rare
990824.6jma	<i>Hybopsis hyipsinotus</i> (highback chub)	S, Sa, G, co, p	electroshock	364s	rare
990824.6jma	<i>Lepomis auritus</i> (redbreast sunfish)	S, Sa, G, co, p	electroshock	364s	common
990824.6jma	<i>Lepomis cyanellus</i> (green sunfish)	S, Sa, G, co, p	electroshock	364s	rare
990824.6jma	<i>Lepomis macrochirus</i> (bluegill)	S, Sa, G, co, p	electroshock	364s	rare
990824.6jma	<i>Micropterus salmoides</i> (largemouth bass)	S, Sa, G, co, p	electroshock	364s	rare
990824.6jma	<i>Minytrema melanops</i> (spotted sucker)	S, Sa, G, co, p	electroshock	364s	rare
990824.6jma	<i>Moxostoma collaratum</i> (v-lip redhorse)	S, Sa, G, co, p	electroshock	364s	rare
990824.6jma	<i>Nocomis leptoccephalus</i> (bluehead chub)	S, Sa, G, co, p	electroshock	364s	common
990824.6jma	<i>Notropis altipinnis</i> (highfin shiner)	S, Sa, G, co, p	electroshock	364s	rare
990824.6jma	<i>Notropis chililicus</i> (redlip shiner)	S, Sa, G, co, p	electroshock	364s	uncommon
990824.6jma	<i>Notropis hudsonius</i> (spottail shiner)	S, Sa, G, co, p	electroshock	364s	rare
990824.6jma	<i>Notropis scepicus</i> (sandbar shiner)	S, Sa, G, co, p	electroshock	364s	rare
<u><i>clam</i></u>					
990824.4jma	<i>Corbicula fluminea</i> (Asian clam)	S, Co, Bo, sa, b, p, g	visual	1.667h	uncommon
000615.1jaj	<i>Corbicula fluminea</i> (Asian clam)	c.s,Sa,g,co,Bo,b,r	visual	3.75h	present
000615.1jaj	<i>Sphaerium striatum</i> (striated fingernailclam)	c.s,Sa,g,co,Bo,b,r	visual	3.75h	present
<u><i>crayfish</i></u>					
990824.4jma	<i>Cambareus (Puncticambarus)</i> sp. nov. (n/a)	S, Co, Bo, sa, b, p, g	dipnet/electroshock	1.667h/4.37	uncommon
000615.1jaj	<i>Cambareus (Puncticambarus)</i> sp. nov. (n/a)	c.s,Sa,g,co,Bo,b,r	dipnet	3.75h	present
000615.1jaj	<i>Procambarus (Ortmannicus)</i> acutus (White River crayfish)	c.s,Sa,g,co,Bo,b,r	dipnet	3.75h	present
<u><i>limpet</i></u>					
990824.4jma	<i>Ferrissia</i> sp. (n/a)	S, Co, Bo, sa, b, p, g	tactile/visual	1.667h	patchy rare
000615.1jaj	<i>Ferrissia</i> sp. (n/a)	c.s,Sa,g,co,Bo,b,r	visual	3.75h	present
<u><i>snail</i></u>					
990824.4jma	<i>Campeloma decisum</i> (pointed campeloma)	S, Co, Bo, sa, b, p, g	tactile/visual	1.667h	n/a
000615.1jaj	<i>Campeloma decisum</i> (pointed campeloma)	c.s,Sa,g,co,Bo,b,r	visual	3.75h	present
990824.4jma	<i>Elminia catenaria</i> (gravel elminia)	S, Co, Bo, sa, b, p, g	tactile/visual	1.667h	abundant
000615.1jaj	<i>Elminia catenaria</i> (gravel elminia)	c.s,Sa,g,co,Bo,b,r	visual	3.75h	present
990824.4jma	<i>Helisoma anceps</i> (two-ridge rams-horn)	S, Co, Bo, sa, b, p, g	tactile/visual	1.667h	patchy common
000615.1jaj	<i>Helisoma anceps</i> (two-ridge rams-horn)	c.s,Sa,g,co,Bo,b,r	visual	3.75h	present

Denson's Creek @ NC 134

Location**Site (date) and species****Search Time** **Technique** **Substrate** **Abundance**Denson's Creek @ NC 134

<u>Location</u>	<u>Site (date) and species</u>	<u>Search Time</u>	<u>Technique</u>	<u>Substrate</u>	<u>Abundance</u>
<u><i>snail</i></u>					
990824.4jma	Physella sp. (physa snail)	S, Co, Bo, sa, b, p, g	tactile/visual	1.667h	patchy/uncommon
000615.1jaj	Physella sp. (physa snail)	c.s, Sa,g,co,Bo,b,r	visual	3.75h	present
990824.4jma	Pseudosuccinea columella (mimic lynnaea)	S, Co, Bo, sa, b, p, g	tactile/visual	1.667h	patchy/uncommon
000615.1jaj	Somatogyrus sp. (pebblesnail)	c.s, Sa,g,co,Bo,b,r	visual	3.75h	present
<u><i>fish</i></u>					
000706.6btw	Aphredoderus sayanus (pirate perch)	n/a	electroshock	264s	rare
990824.4jma	Chaenobrytus gulosis (warmouth)	S, Co, Bo, sa, b, p, g	electroshock	437s	uncommon
000706.6btw	Chaenobrytus gulosis (warmouth)	n/a	electroshock	264s	rare
000706.6btw	Clinostomus funduloides (rosy-side dace)	n/a	electroshock	264s	uncommon
000706.6btw	Etheostoma fimbriare (fantail darter)	n/a	electroshock	264s	rare
990824.4jma	Etheostoma olmstedi (tessellated darter)	S, Co, Bo, sa, b, p, g	electroshock	437s	rare
000706.6btw	Etheostoma olmstedi (tessellated darter)	n/a	electroshock	264s	common
990824.4jma	Lepomis auritus (redbreast sunfish)	S, Co, Bo, sa, b, p, g	electroshock	437s	common
000706.6btw	Lepomis auritus (redbreast sunfish)	n/a	electroshock	264s	common
000706.6btw	Lepomis macrochirus (bluegill)	n/a	electroshock	264s	rare
000706.6btw	Micropterus salmoides (largemouth bass)	S, Co, Bo, sa, b, p, g	electroshock	437s	common
990824.4jma	Nocomis leptocephalus (bluehead chub)	n/a	electroshock	264s	common
000706.6btw	Nocomis leptocephalus (bluehead chub)	S, Co, Bo, sa, b, p, g	electroshock	437s	rare
990824.4jma	Notropis altipinnis (highfin shiner)	n/a	electroshock	264s	common
000706.6btw	Notropis altipinnis (highfin shiner)	S, Co, Bo, sa, b, p, g	electroshock	437s	common
990824.4jma	Notropis chilicticus (redlip shiner)	n/a	electroshock	264s	common
000706.6btw	Notropis chilicticus (redlip shiner)	S, Co, Bo, sa, b, p, g	electroshock	437s	rare
990824.4jma	Notropis hudsonius (spottail shiner)	S, Co, Bo, sa, b, p, g	electroshock	437s	rare
990824.4jma	Notropis insignis (margined madtom)	n/a	electroshock	264s	rare
000706.6btw	Notropis insignis (margined madtom)	S, Co, Bo, sa, b, p, g	electroshock	437s	uncommon
990824.4jma	Scartomyzon sp./Moxostoma sp. (redhorse sucker)	n/a	electroshock	264s	uncommon
000706.6btw	Scartomyzon sp./Moxostoma sp. (redhorse sucker)				
<u><i>clam</i></u>					
990823.3jma	Corbicula fluminea (Asian clam)	S, Co, sa, b, bo, p, g	tactile/visual	2h	common
<u><i>crayfish</i></u>					
990823.3jma	Cambareus (Puncticambarus) sp. nov. (n/a)	S, Co, sa, b, bo, p, g	dipnet/electroshock	2h/501s	uncommon

Denson's Creek @ SR_1323

Location	Site (date) and species	Substrate	Technique	Time	Abundance
Search					
Denson's Creek @ SR 1323					
<u>limpet</u>	990823.3jma Ferrissia sp. (n/a)	S, Co, sa, b, bo, p, g	tactile/visual	2h	patchy rare
<u>snail</u>	990823.3jma Elimia catenaria (gravel elimia)	S, Co, sa, b, bo, p, g	tactile/visual	2h	patchy common
	990823.3jma Heliomoma anceps (two-ridge rams-horn)	S, Co, sa, b, bo, p, g	tactile/visual	2h	patchy common
	990823.3jma Physella sp. (physa snail)	S, Co, sa, b, bo, p, g	tactile/visual	2h	patchy uncommon
<u>fish</u>					
	990823.3jma Erimyzon oblongus (creek chub sucker)	S, Co, sa, b, bo, p, g	electroshock	501s	rare
	990823.3jma Etheostoma flabellare (fantail darter)	S, Co, sa, b, bo, p, g	electroshock	501s	rare
	990823.3jma Etheostoma olmstedi (tessellated darter)	S, Co, sa, b, bo, p, g	electroshock	501s	abundant
	990823.3jma Hybopsis hypsinotus (highback chub)	S, Co, sa, b, bo, p, g	electroshock	501s	common
	990823.3jma Lepomis auritus (redbreast sunfish)	S, Co, sa, b, bo, p, g	electroshock	501s	common
	990823.3jma Lepomis cyanellus (green sunfish)	S, Co, sa, b, bo, p, g	electroshock	501s	rare
	990823.3jma Lepomis macrochirus (bluegill)	S, Co, sa, b, bo, p, g	electroshock	501s	rare
	990823.3jma Micropterus salmoides (largemouth bass)	S, Co, sa, b, bo, p, g	electroshock	501s	present
	990823.3jma Minytrema melanops (spotted sucker)	S, Co, sa, b, bo, p, g	electroshock	501s	uncommon
	990823.3jma Nocomis leptolepidus (bluehead chub)	S, Co, sa, b, bo, p, g	electroshock	501s	common
	990823.3jma Notropis altipinnis (highfin shiner)	S, Co, sa, b, bo, p, g	electroshock	501s	common
	990823.3jma Notropis chilictus (redlip shiner)	S, Co, sa, b, bo, p, g	electroshock	501s	present
	990823.3jma Notropis hudsonius (spottail shiner)	S, Co, sa, b, bo, p, g	electroshock	501s	present
	990823.3jma Notropis septicus (sandbar shiner)	S, Co, sa, b, bo, p, g	electroshock	501s	rare
	990823.3jma Noturus insignis (marginated madtom)	S, Co, sa, b, bo, p, g	electroshock	501s	uncommon
	990823.3jma Percina crassa (piedmont darter)	S, Co, sa, b, bo, p, g	electroshock	501s	uncommon
	990823.3jma Scarletonyx sp. (brassy jumprock)	S, Co, sa, b, bo, p, g	electroshock	501s	rare
	990823.3jma Semotilus atromaculatus (creek chub)	S, Co, sa, b, bo, p, g	electroshock	501s	
Doomas Creek @ SR 1310					
<u>crayfish</u>					
	000608.1jaj Cambarus (Puncticambarus) sp. nov. (n/a)	c,s, Sa, G, Co, bo	dipnet	2h	present
	000706.5btw Cambarus (Puncticambarus) sp. nov. (n/a)	n/a	electroshock	256s	uncommon
	000706.5btw Procambarus (Ortmannicus) acutus (White River crayfish)	n/a	electroshock	256s	common
<u>snail</u>					
	000608.1jaj Campeloma decisum (pointed campeloma)	c,s, Sa, G, Co, bo	visual	2h	present
	000608.1jaj Elimia catenaria (gravel elimia)	c,s, Sa, G, Co, bo	visual	2h	present

Location	Site (date) and species	Substrate	Technique	Time	Abundance
Doomas Creek @ SR 1310					

<i>fish</i>					
000706.5btw	Clinostomus funduloides (rosy side dace)	n/a	electroshock	256s	rare
000706.5btw	Etheostoma olmstedi (tessellated darter)	n/a	electroshock	256s	uncommon
000706.5btw	Hybopsis hypsinotus (highback chub)	n/a	electroshock	256s	common
000706.5btw	Lepomis auritus (redbreast sunfish)	n/a	electroshock	256s	common
000706.5btw	Nocomis leptocephalus (bluehead chub)	n/a	electroshock	256s	uncommon
000706.5btw	Notropis aitiphinis (highfin shiner)	n/a	electroshock	256s	common
000706.5btw	Notropis chililicus (redlip shiner)	n/a	electroshock	256s	common
000706.5btw	Scartomyzon sp./Moxostoma sp. (redhorse sucker)	n/a	electroshock	256s	common

Lick Fork @ SR 1129

<i>crayfish</i>					
000609.3jaj	Cambarus (Puncticambarus) sp. nov. (n/a)	c,S,Sa,G,co,bo,b	overtur rocks	1.5h	present
000609.3jaj	Procambarus (Ortmannicus) acutus (White River crayfish)	c,S,Sa,G,co,bo,b	overtur rocks	1.5h	present
000705.8btw	Procambarus (Ortmannicus) acutus (White River crayfish)	n/a	electroshock	185s	present
<i>snail</i>					
000609.3jaj	Physella sp. (physa snail)	c,S,Sa,G,co,bo,b	visual	1.5h	present
<i>fish</i>					
000705.8btw	Aphredoderus sayanus (pirate perch)	n/a	electroshock	185s	rare
000705.8btw	Catostomus commersoni (white sucker)	n/a	electroshock	185s	rare
000705.8btw	Clinostomus funduloides (rosy side dace)	n/a	electroshock	185s	common
000705.8btw	Etheostoma flabellare (fanail darter)	n/a	electroshock	185s	rare
000705.8btw	Etheostoma olmstedi (tessellated darter)	n/a	electroshock	185s	uncommon
000705.8btw	Lepomis auritus (redbreast sunfish)	n/a	electroshock	185s	common
000705.8btw	Lepomis cyanellus (green sunfish)	n/a	electroshock	185s	rare
000705.8btw	Nocomis leptocephalus (bluehead chub)	n/a	electroshock	185s	common
000705.8btw	Notropis chililicus (redlip shiner)	n/a	electroshock	185s	common
000705.8btw	Notropis scepticus (sandbar shiner)	n/a	electroshock	185s	rare
000705.8btw	Semotilus atromaculatus (creek chub)	n/a	electroshock	185s	uncommon
<i>crayfish</i>					
000614.1jaj	Cambarus (Puncticambarus) sp. nov. (n/a)	c,S,Sa,g,co	dipnet	1.5h	present
000706.1btw	Cambarus (Puncticambarus) sp. nov. (n/a)	n/a	electroshock	245s	rare
000614.1jaj	Procambarus (Ortmannicus) acutus (White River crayfish)	c,S,Sa,g,co	dipnet	1.5h	present
000706.1btw	Procambarus (Ortmannicus) acutus (White River crayfish)	n/a	electroshock	245s	common

Little Hamer Creek @ SR 1115

<i>crayfish</i>					
000614.1jaj	Cambarus (Puncticambarus) sp. nov. (n/a)	c,S,Sa,g,co	dipnet	1.5h	present
000706.1btw	Cambarus (Puncticambarus) sp. nov. (n/a)	n/a	electroshock	245s	rare
000614.1jaj	Procambarus (Ortmannicus) acutus (White River crayfish)	c,S,Sa,g,co	dipnet	1.5h	present
000706.1btw	Procambarus (Ortmannicus) acutus (White River crayfish)	n/a	electroshock	245s	common

Location	Site (date) and species	Substrate	Technique	Search Time	Abundance
Little Hamer Creek @ SR 1115					
	<u><i>limpet</i></u>				
	000614.1jaj Ferrissia sp. (n/a)	c,s,sa,g,co	visual	1.5h	present
	<u><i>snail</i></u>				
	000614.1jaj <i>Helisoma anceps</i> (two-ridge rams-horn)	c,s,sa,g,co	visual	1.5h	common
	000614.1jaj <i>Micromenetus dilatatus</i> (bugle sprite)	c,s,sa,g,co	visual	1.5h	present
	000614.1jaj <i>Physella</i> sp. (physa snail)	c,s,sa,g,co	visual	1.5h	abundant
	<u><i>fish</i></u>				
	000706.1btw <i>Acantharchus pomotis</i> (mud sunfish)	n/a	electroshock	245s	rare
	000706.1btw <i>Ameiurus natalis</i> (yellow bullhead)	n/a	electroshock	245s	rare
	000706.1btw <i>Aphredoderus sayanus</i> (pirate perch)	n/a	electroshock	245s	common
	000706.1btw <i>Chaenobrytus gullosus</i> (warmouth)	n/a	electroshock	245s	rare
	000706.1btw <i>Clinostomus funduloides</i> (rosy-side dace)	n/a	electroshock	245s	common
	000706.1btw <i>Erimyzon oblongus</i> (creek chubsucker)	n/a	electroshock	245s	common
	000706.1btw <i>Esox niger</i> (chain pickerel)	n/a	electroshock	245s	rare
	000706.1btw <i>Etheostoma flabellare</i> (fantail darter)	n/a	electroshock	245s	uncommon
	000706.1btw <i>Etheostoma olmstedi</i> (tessellated darter)	n/a	electroshock	245s	common
	000706.1btw <i>Lepomis auritus</i> (redbreast sunfish)	n/a	electroshock	245s	common
	000706.1btw <i>Lepomis cyanellus</i> (green sunfish)	n/a	electroshock	245s	common
	000706.1btw <i>Nothonotus leptocephalus</i> (bluehead chub)	n/a	electroshock	245s	common
	000706.1btw <i>Notropis altipinnis</i> (highfin shiner)	n/a	electroshock	245s	common
	000706.1btw <i>Semotilus atomaculatus</i> (creek chub)	n/a	electroshock	245s	rare
Little River @ SR 1340					
	<u><i>clam</i></u>				
	990824.3jma <i>Corbicula fluminea</i> (Asian clam)	s,sa,co,b,p,g,r	tactile/visual	2h	common
	990824.3jma <i>Sphaeriidae</i> (pea clam)	s,sa,co,b,p,g,r	tactile/visual	2h	uncommon
	<u><i>limpet</i></u>				
	990824.3jma Ferrissia sp. (n/a)	s,sa,co,b,p,g,r	tactile/visual	2h	patchy rate
	<u><i>snail</i></u>				
	990824.3jma <i>Campteloma decistum</i> (pointed campeloma)	s,sa,co,b,p,g,r	tactile/visual	2h	patchy common
	990824.3jma <i>Elminia catenaria</i> (gravel elminia)	s,sa,co,b,p,g,r	tactile/visual	2h	abundant
	990824.3jma <i>Elminia proxima</i> (sprite elminia)	s,sa,co,b,p,g,r	tactile/visual	2h	abundant
	990824.3jma <i>Hydrobiidae</i> (hydrobiid)	s,sa,co,b,p,g,r	tactile/visual	2h	common

Location	Site (date) and species	Substrate	Technique	Time	Abundance
<u>Little River @ SR 1340</u>					
<u>fish</u>					
990824.3jma	Ameiurus brunneus (snail bullhead)	S, Sa, Co, B, p, g, r	electroshock	576s	rare
990824.3jma	Cyprinella analostana (satinfin shiner)	S, Sa, Co, B, p, g, r	electroshock	576s	rare
990824.3jma	Etheostoma olmstedi (tessellated darter)	S, Sa, Co, B, p, g, r	electroshock	576s	uncommon
990824.3jma	Lepomis auritus (redbreast sunfish)	S, Sa, Co, B, p, g, r	electroshock	576s	abundant
990824.3jma	Lepomis macrochirus (bluegill)	S, Sa, Co, B, p, g, r	electroshock	576s	rare
990824.3jma	Nothonotus leptcephalus (bluehead chub)	S, Sa, Co, B, p, g, r	electroshock	576s	common
990824.3jma	Notropis chilensis (redlip shiner)	S, Sa, Co, B, p, g, r	electroshock	576s	common
990824.3jma	Notropis scriptus (sandbar shiner)	S, Sa, Co, B, p, g, r	electroshock	576s	rare
990824.3jma	Percina crassa (piedmont darter)	S, Sa, Co, B, p, g, r	electroshock	576s	rare
990824.3jma	Scartomyzon sp. (brassy jumprock)	S, Sa, Co, B, p, g, r	electroshock	576s	uncommon
<u>Little River @ SR 1554</u>					
<u>crayfish</u>					
990823.2jma	Cambarus (Puncticambarus) sp. nov. (n/a)	Sa, Co, bo, g, d	dipnet/electroshock	2h/462s	uncommon
<u>limpet</u>					
990823.2jma	Ferrissia sp. (n/a)	Sa, Co, bo, g, d		2h	common
<u>snail</u>					
990823.2jma	Helisoma aneps (two-ridge rams-horn)	Sa, Co, bo, g, d	tactile/visual	2h	common
990823.2jma	Micromenetus dilatatus (bugle sprite)	Sa, Co, bo, g, d	tactile/visual	2h	patchy uncommon
990823.2jma	Physella sp. (physa snail)	Sa, Co, bo, g, d	tactile/visual	2h	common
<u>fish</u>					
990823.2jma	Ameiurus catus (white catfish)	Sa, Co, bo, g, d	electroshock	462s	rare
990823.2jma	Ameiurus platycephalus (flat bullhead)	Sa, Co, bo, g, d	electroshock	462s	uncommon
990823.2jma	Erimyzon oblongus (creek chubsucker)	Sa, Co, bo, g, d	electroshock	462s	rare
990823.2jma	Esox niger (chain pickerel)	Sa, Co, bo, g, d	electroshock	462s	rare
990823.2jma	Etheostoma olmstedi (tessellated darter)	Sa, Co, bo, g, d	electroshock	462s	abundant
990823.2jma	Lepomis auritus (redbreast sunfish)	Sa, Co, bo, g, d	electroshock	462s	common
990823.2jma	Lepomis macrochirus (bluegill)	Sa, Co, bo, g, d	electroshock	462s	common
990823.2jma	Micropterus salmoides (largemouth bass)	Sa, Co, bo, g, d	electroshock	462s	rare
990823.2jma	Notemigonus crysoleucas (golden shiner)	Sa, Co, bo, g, d	electroshock	462s	rare
990823.2jma	Notropis petersoni (coastal shiner)	Sa, Co, bo, g, d	electroshock	462s	na
990823.2jma	Percina crassa (piedmont darter)	Sa, Co, bo, g, d	electroshock	462s	rare
990823.2jma	Scartomyzon sp. (brassy jumprock)	Sa, Co, bo, g, d	electroshock	462s	rare

Location	Site (date) and species	Substrate	Technique	Search Time	Abundance
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Mountain Creek @ SR 1533

<u>crayfish</u>	000609.2:jaj Cambarus (Puncticambarus) sp. nov. (n/a)	c, S, Sa, g, bo	overtur	1.16h	present
	000706.2:btw Cambarus (Puncticambarus) sp. nov. (n/a)	n/a	electroshock/Visual	rare	rare
	000706.2:btw Procambarus (Ortmannicus) acutus (White River crayfish)	n/a	electroshock	379s	present
<u>Fish</u>					
	000706.2:btw Aphredoderus sayanus (pirate perch)	n/a	electroshock	379s	rare
	000706.2:btw Catostomus commersoni (white sucker)	n/a	electroshock	379s	rare
	000706.2:btw Chaenobrytus gulosus (warmouth)	n/a	electroshock	379s	rare
	000706.2:btw Clinostomus funduloides (rosy-side dace)	n/a	electroshock	379s	common
	000706.2:btw Etheostoma olmstedi (tessellated darter)	n/a	electroshock	379s	common
	000706.2:btw Lepomis auritus (redbreast sunfish)	n/a	electroshock	379s	common
	000706.2:btw Noconis leptocephalus (bluehead chub)	n/a	electroshock	379s	common
	000706.2:btw Notropis chilicticus (redlip shiner)	n/a	electroshock	379s	common
	000706.2:btw Notropis Cummingsae (dusky shiner)	n/a	electroshock	379s	rare
	000706.2:btw Noturus insignis (margined madtom)	n/a	electroshock	379s	rare
	000706.2:btw Semotilus atromaculatus (creek chub)	n/a	electroshock	379s	uncommon
<u>Naked Creek @ SR 1527</u>					
<u>crayfish</u>	000706.3:btw Procambarus (Ortmannicus) acutus (White River crayfish)	n/a	Visual/electroshock	present	
<u>Fish</u>					
	000706.3:btw Aphredoderus sayanus (pirate perch)	n/a	electroshock	253s	rare
	000706.3:btw Erimyzon oblongus (creek chubsucker)	n/a	electroshock	253s	common
	000706.3:btw Etheostoma mariae Etheostoma mariae (pinewoods darter)	n/a	electroshock	253s	rare
	000706.3:btw Lepomis auritus (redbreast sunfish)	n/a	electroshock	253s	uncommon
	000706.3:btw Noconis leptocephalus (bluehead chub)	n/a	electroshock	253s	rare
	000706.3:btw Notropis Cummingsae (dusky shiner)	n/a	electroshock	253s	uncommon
<u>lumber</u>					
<u>crayfish</u>	000615.4:jaj Cambarus (Puncticambarus) sp. nov. (n/a)	c, S, Sa, G, Co, b	visual/electroshock	1.25h	common
	000705.2:btw Cambarus (Puncticambarus) sp. nov. (n/a)	n/a	electroshock	443s	common
	000705.2:btw Procambarus (Ortmannicus) acutus (White River crayfish)	n/a	electroshock	443s	common
<u>Poison Fork @ SR 1306</u>					

Location	Site (date) and species	Substrate	Technique	Time	Search Abundance
<u>Poison Fork @ SR 1306</u>					
<u><i>fish</i></u>					
000705.2btw	<i>Clinostomus funduloides</i> (rosy-side dace)	n/a	electroshock	443s	patchy uncommon
000705.2btw	<i>Erinyzon oblongus</i> (creek chub sucker)	n/a	electroshock	443s	rare
000705.2btw	<i>Etheostoma flabellare</i> (faintail darter)	n/a	electroshock	443s	rare
000705.2btw	<i>Etheostoma olmstedi</i> (tessellated darter)	n/a	electroshock	443s	rare
000705.2btw	<i>Hybopsis hypsinotus</i> (highback chub)	n/a	electroshock	443s	patchy common
000705.2btw	<i>Lepomis auritus</i> (redbreast sunfish)	n/a	electroshock	443s	common
000705.2btw	<i>Lepomis macrochirus</i> (bluegill)	n/a	electroshock	443s	rare
000705.2btw	<i>Notropis altipinnis</i> (highfin shiner)	n/a	electroshock	443s	present
000705.2btw	<i>Notropis chiliticus</i> (redlip shiner)	n/a	electroshock	443s	patchy common
000705.2btw	<i>Noturus insignis</i> (margined madtom)	n/a	electroshock	443s	rare
000705.2btw	<i>Percina crassa</i> (piedmont darter)	n/a	electroshock	443s	rare
<u>Rocky Creek @ SR 1543</u>					
<u><i>clam</i></u>					
990823.1jma	<i>Corbicula fluminea</i> (Asian clam)	Co, B, G, sa, p, r	tactile/visual	2h	n/a
<u><i>crayfish</i></u>					
990823.1jma	<i>Cambarus</i> (<i>Puncticarbarus</i>) sp. nov. (n/a)	Co, B, G, sa, p, r	dipnet/electroshock	2h/650s	common
990823.1jma	<i>Procamarbarus</i> (<i>Ortmannicus</i>) <i>acutus</i> (White River crayfish)	Co, B, G, sa, p, r	dipnet/electroshock	2h/650s	common
<u><i>limpet</i></u>					
990823.1jma	<i>Ferriessa</i> sp. (n/a)	Co, B, G, sa, p, r	tactile/visual	2h	n/a
<u><i>snail</i></u>					
990823.1jma	<i>Elimia proxima</i> (spire elimia)	Co, B, G, sa, p, r	tactile/visual	2h	abundant
990823.1jma	<i>Helisoma anceps</i> (two-ridge rams-horn)	Co, B, G, sa, p, r	tactile/visual	2h	n/a
990823.1jma	<i>Physella</i> sp. (physa snail)	Co, B, G, sa, p, r	tactile/visual	2h	n/a
<u><i>fish</i></u>					
990823.1jma	<i>Ameiurus nebulosus</i> (brown bullhead)	Co, B, G, sa, p, r	electroshock	650s	rare
990823.1jma	<i>Ameiurus platycephalus</i> (flat bullhead)	Co, B, G, sa, p, r	electroshock	650s	uncommon
990823.1jma	<i>Esox niger</i> (chain pickerel)	Co, B, G, sa, p, r	electroshock	650s	rare
990823.1jma	<i>Etheostoma flabellare</i> (faintail darter)	Co, B, G, sa, p, r	electroshock	650s	rare
990823.1jma	<i>Etheostoma olmstedi</i> (tessellated darter)	Co, B, G, sa, p, r	electroshock	650s	uncommon
990823.1jma	<i>Lepomis auritus</i> (redbreast sunfish)	Co, B, G, sa, p, r	electroshock	650s	common
990823.1jma	<i>Lepomis cyanellus</i> (green sunfish)	Co, B, G, sa, p, r	electroshock	650s	rare
990823.1jma	<i>Lepomis macrochirus</i> (bluegill)	Co, B, G, sa, p, r	electroshock	650s	common
990823.1jma	<i>Nothonotus leptcephalus</i> (bluehead chub)	Co, B, G, sa, p, r	electroshock	650s	common

Location	Site (date) and species	Substrate	Technique	Time	Search Abundance
<u>Rocky Creek @ SR 1543</u>					
<u><i>fish</i></u>					
990823.1jma	Notropis chiliticus (redlip shiner)	Co, B, G, sa, p, r	electroshock	650s	uncommon
990823.1jma	Notropis petersoni (coastal shiner)	Co, B, G, sa, p, r	electroshock	650s	rare
990823.1jma	Noturus insignis (margined madtom)	Co, B, G, sa, p, r	electroshock	650s	uncommon
990823.1jma	Scartomyzon sp. (brassy jumprock)	Co, B, G, sa, p, r	electroshock	650s	uncommon
<u>Town Creek @ SR 1542</u>					
<u><i>clam</i></u>					
990824.5jma	Corbicula fluminea (Asian clam)	Sa, G, Co, s, c, p	tactile/visual	0.667h	uncommon
990824.5jma	Sphaeriidae (pea clam)	Sa, G, Co, s, c, p	tactile/visual	0.667h	uncommon
<u><i>crayfish</i></u>					
990824.5jma	Cambarus (Puncticambarus) sp. nov. (n/a)	Sa, G, Co, s, c, p	dipnet	0.667h	uncommon
990824.5jma	Procambarus (Ortmannicus) acutus (White River crayfish)	Sa, G, Co, s, c, p	dipnet	0.667h	rare
<u><i>fish</i></u>					
990824.5jma	Gambusia holbrookii (eastern mosquitofish)	Sa, G, Co, s, c, p	dipnet/ seine	0.667h	patchy rare
990824.5jma	Lepomis sp. (sunfish)	Sa, G, Co, s, c, p	dipnet/ seine	0.667h	patchy rare
990824.5jma	Nothonotus leptocephalus (bluehead chub)	Sa, G, Co, s, c, p	visual	0.667h	present
<u>Tributary to Barnes Creek @ SR 1303</u>					
<u><i>crayfish</i></u>					
000608.4jaj	Cambarus (Puncticambarus) sp. nov. (n/a)	sa, G, Co, bo	overtur rocks	0.6h	present
000705.5btw	Cambarus (Puncticambarus) sp. nov. (n/a)	n/a	electroshock	388s	present
<u><i>limpet</i></u>					
000608.4jaj	Ferrissia sp. (n/a)	sa, G, Co, bo	visual	0.6h	present
<u><i>fish</i></u>					
000705.5btw	Cyprinella pyrrhomenes (fieryblack shiner)	n/a	electroshock	388s	rare
000705.5btw	Etheostoma flabellare (fantail darter)	n/a	electroshock	388s	rare
000705.5btw	Lepomis auritus (redbreast sunfish)	n/a	electroshock	388s	common
000705.5btw	Micropterus dolomieu (smallmouth bass)	n/a	electroshock	388s	uncommon
000705.5btw	Moxostoma collarsum (v-lip redhorse)	n/a	electroshock	388s	present
000705.5btw	Nothonotus leptocephalus (bluehead chub)	n/a	electroshock	388s	common
000705.5btw	Notropis chiliticus (redlip shiner)	n/a	electroshock	388s	common
000705.5btw	Notropis sp. (shiner)	n/a	visual		present

Location	Site (date) and species	Substrate	Technique	Search Time	Abundance
<u>Uwharrie River @ SR 1301</u>					
	<u>crayfish</u>				
	000705.1btw Cambiarus (Puncticambiarus) sp. nov. (n/a)	n/a	electroshock	471s	present
	000705.1btw Procambarus (Ortmannicus) acutus (White River crayfish)	n/a	electroshock	471s	present
	<u>snail</u>				
	000601.3jaj Campeloma decisum (pointed campeloma)	s,sa,g,Co,bo,b	visual	2.5h	present
	000601.3jaj Elimia catenaria (gravel elimia)	s,sa,g,Co,bo,b	visual	2.5h	present
	000601.3jaj Helisoma anceps (two-ridge ram's-horn)	s,sa,g,Co,bo,b	visual	2.5h	present
	<u>fish</u>				
	000705.1btw Ameiurus platycephalus (flat bullhead)	n/a	electroshock	471s	rare
	000705.1btw Chaenobrytus gulosus (warmouth)	n/a	electroshock	471s	rare
	000705.1btw Erimyzon oblongus (creek chubsucker)	n/a	electroshock	471s	rare
	000705.1btw Etheostoma flabellare (fantail darter)	n/a	electroshock	471s	common
	000705.1btw Lepomis auritus (redbreast sunfish)	n/a	electroshock	471s	common
	000705.1btw Nothonotus leptocephalus (bluehead chub)	n/a	electroshock	471s	uncommon
	000705.1btw Notropis nudsonius (spottail shiner)	n/a	electroshock	471s	common
	000705.1btw Notropis scepticus (sandbar shiner)	n/a	electroshock	471s	common
	000705.1btw Notropis insignis (marginated madtom)	n/a	electroshock	471s	rare
<u>W Fork Little River @ SR 1311</u>					
	<u>clam</u>				
	990824.2jma Corbicula fluminea (Asian clam)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h	uncommon
	990824.2jma Sphaeriidae (pea clam)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h	rare
	<u>crayfish</u>				
	990824.2jma Cambiarus (Puncticambiarus) sp. nov. (n/a)	S, Sa, Co, Bo, b, p, g, d	dipnet/electroshock	2h/405s	common
	990824.2jma Procambarus (Ortmannicus) acutus (White River crayfish)	S, Sa, Co, Bo, b, p, g, d	dipnet/electroshock	2h/405s	uncommon
	<u>limpet</u>				
	990824.2jma Ferrissia sp. (n/a)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h	patchy rare
	<u>snail</u>				
	990824.2jma Campeloma decisum (pointed campeloma)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h	rare
	990824.2jma Elimia catenaria (gravel elimia)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h	abundant
	990824.2jma Elimia proxima (spire elimia)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h	abundant
	990824.2jma Helisoma anceps (two-ridge ram's-horn)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h	patchy common
	990824.2jma Micromenetus dilatatus (bulge sprite)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h	patchy rare
	990824.2jma Physella sp. (physa snail)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h	patchy uncommon

Location	Site (date) and species	Substrate	Technique	Time	Abundance
W Fork Little River @ SR 1311					
	<i>fish</i>				
	990824.2jma <i>Amiurus platycephalus</i> (flat bullhead)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	rare
	990824.2jma <i>Catostomus commersoni</i> (white sucker)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	rare
	990824.2jma <i>Clinostomus funduloides</i> (rosy-side dace)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	abundant
	990824.2jma <i>Etheostoma flabellare</i> (fantail darter)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	rare
	990824.2jma <i>Etheostoma olmstedi</i> (tesselated darter)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	common
	990824.2jma <i>Hybopsis hypsinotus</i> (highback chub)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	uncommon
	990824.2jma <i>Lepomis auritus</i> (redbreast sunfish)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	common
	990824.2jma <i>Nothonotus leptocephalus</i> (bluehead chub)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	common
	990824.2jma <i>Notropis chililicus</i> (redlip shiner)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	abundant
	990824.2jma <i>Notropis petersoni</i> (coastal shiner)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	rare
	990824.2jma <i>Noturus insignis</i> (margined madtom)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	common
	990824.2jma <i>Percina crassa</i> (piedmont darter)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	uncommon
	990824.2jma <i>Scartomyzon</i> sp. (brassy jumprock)	S, Sa, Co, Bo, b, p, g, d	electroshock	405s	rare
Wood Run Creek					
	<i>crayfish</i>				
	000608.2-1aj <i>Cambarus</i> (Puncticambarus) sp. nov. (n/a)	s,sa,g,Co,Bo,B	overtur rocks	1h	present
	000705.7btw <i>Cambarus</i> sp. (n/a)	n/a	electroshock	208s	present
	<i>fish</i>				
	000705.7btw <i>Erimyzon oblongus</i> (creek chubsucker)	n/a	electroshock	208s	rare
	000705.7btw <i>Lepomis auritus</i> (redbreast sunfish)	n/a	electroshock	208s	common
	000705.7btw <i>Lepomis cyanellus</i> (green sunfish)	n/a	electroshock	208s	rare
	000705.7btw <i>Nothonotus leptocephalus</i> (bluehead chub)	n/a	electroshock	208s	common
	000705.7btw <i>Notropis aitipinnis</i> (highfin shiner)	n/a	electroshock	208s	rare
	000705.7btw <i>Notropis chililicus</i> (redlip shiner)	n/a	electroshock	208s	common
	000705.7btw <i>Semotilus atromaculatus</i> (creek chub)	n/a	electroshock	208s	common

Location	Site (date) and species	Substrate	Technique	Search Time	Abundance
Randolph County					
Little River @ SR 1127					
<u>clam</u>					
990824.1jma	Corbicula fluminea (Asian clam)	Sa, Co, Bo, s, p, g	tactile/visual	2h	common
<u>crayfish</u>					
990824.1jma	Cambareus (Puncticambarus) sp. nov. (n/a)	Sa, Co, Bo, s, p, g	dipnet/electroshock	2h/45s	uncommon
<u>limpet</u>					
990824.1jma	Ferrissia sp. (n/a)	Sa, Co, Bo, s, p, g	tactile/visual	2h	uncommon
<u>snail</u>					
990824.1jma	Elminia catenaria (gravel elminia)	Sa, Co, Bo, s, p, g	tactile/visual	2h	abundant
990824.1jma	Elminia proxima (spite elminia)	Sa, Co, Bo, s, p, g	tactile/visual	2h	n/a
<u>fish</u>					
990824.1jma	Etheostoma flabellare (fantail darter)	Sa, Co, Bo, s, p, g	electroshock	45s	rare
990824.1jma	Etheostoma olmstedi (tessellated darter)	Sa, Co, Bo, s, p, g	electroshock	45s	common
990824.1jma	Lepomis auritus (redbreast sunfish)	Sa, Co, Bo, s, p, g	electroshock	45s	common
990824.1jma	Lepomis macrochirus (bluegill)	Sa, Co, Bo, s, p, g	electroshock	45s	uncommon
990824.1jma	Nothonotus leptocephalus (bluehead chub)	Sa, Co, Bo, s, p, g	electroshock	45s	uncommon
990824.1jma	Notropis altipinnis (highfin shiner)	Sa, Co, Bo, s, p, g	electroshock	45s	rare
990824.1jma	Notropis chililoticus (redlip shiner)	Sa, Co, Bo, s, p, g	electroshock	45s	abundant
990824.1jma	Notropis hudsonius (spottail shiner)	Sa, Co, Bo, s, p, g	electroshock	45s	rare
990824.1jma	Notropis insignis (margined madtom)	Sa, Co, Bo, s, p, g	electroshock	45s	common
990824.1jma	Percina crassa (piedmont darter)	Sa, Co, Bo, s, p, g	electroshock	45s	uncommon
990824.1jma	Scartomyzon sp./Moxostoma sp. (redhorse sucker)	Sa, Co, Bo, s, p, g	electroshock	45s	rare

Table 3. Mussel species found during the aquatic inventory of Montgomery County, 1999-2000.

Location	Site (date) and species	Substrate	Technique	Search Time	# Live # Shells
Montgomery County					
Barnes Creek @ SR 1134					
000615.2:jaj	Alasmidonta varicosa (brook floater)	c.s,Sa,G,Cc,bo,b	visual	4h	3
000615.2:jaj	Elliptio angustata (Carolina lance)	c.s,Sa,G,Cc,bo,b	visual	4h	11
000615.2:jaj	Elliptio spp. (n/a)	c.s,Sa,G,Cc,bo,b	visual	4h	116
000615.2:jaj	Villosa constricta (notched rainbow)	c.s,Sa,G,Cc,bo,b	visual	4h	4
000615.2:jaj	Villosa delumbis (eastern creekshell)	c.s,Sa,G,Cc,bo,b	visual	4h	4
000615.2:jaj	Villosa vaughaniana (Carolina creekshell)	c.s,Sa,G,Cc,bo,b	visual	4h	7
Bridger's Creek @ SR 1519					
000615.3:jaj	Elliptio spp. (n/a)	s,sa,G,Co,bo	visual	1.7h	2
000615.3:jaj	Villosa delumbis (eastern creekshell)	s,sa,G,Co,bo	visual	1.7h	1
000615.3:jaj	Villosa vaughaniana (Carolina creekshell)	s,sa,G,Co,bo	visual	1.7h	3
Cheek Creek @ SR 1541					
990824.6:jma	Elliptio angustata (Carolina lance)	S, Sa, G, co, p	tactile/visual	1.25h	1
990824.6:jma	Elliptio complanata (eastern Elliptio)	S, Sa, G, co, p	tactile/visual	1.25h	1
Denson's Creek @ NC 134					
000615.1:jaj	Alasmidonta varicosa (brook floater)	c.s,Sa,g,co,Bo,br	visual	3.75h	3
000615.1:jaj	Elliptio spp. (n/a)	c.s,Sa,g,co,Bo,br	visual	3.75h	20
000615.1:jaj	Villosa constricta (notched rainbow)	c.s,Sa,g,co,Bo,br	visual	3.75h	1
000615.1:jaj	Villosa delumbis (eastern creekshell)	c.s,Sa,g,co,Bo,br	visual	3.75h	6
990824.4:jma	Villosa vaughaniana (Carolina creekshell)	S, Co, Bo, sa, b, p, g	visual	1.667h	2
000615.1:jaj	Villosa vaughaniana (Carolina creekshell)	c.s,Sa,g,co,Bo,br	visual	3.75h	1
Denson's Creek @ SR 1323					
990823.3:jma	Elliptio angustata (Carolina lance)	S, Co, sa, b, bo, p, g	tactile/visual	2h	8
990823.3:jma	Elliptio complanata (eastern Elliptio)	S, Co, sa, b, bo, p, g	tactile/visual	2h	90
990823.3:jma	Elliptio icterina (variable spike)	S, Co, sa, b, bo, p, g	tactile/visual	2h	1
990823.3:jma	Elliptio sp. (n/a)	S, Co, sa, b, bo, p, g	tactile/visual	2h	1
990823.3:jma	Villosa vaughaniana (Carolina creekshell)	S, Co, sa, b, bo, p, g	tactile/visual	3h	3

Location	Site (date) and species	Substrate	Technique	Time	# Live # Shells
<u>Doomas Creek @ SR 1310</u>					
000608.1.jaj	Elliptio spp. (n/a)	c.s,Sa,G,Co,bo			
000608.1.jaj	Villosa delumbis (eastern creekshell)	c.s,Sa,G,Co,bo			
000608.1.jaj	Villosa vaughaniana (Carolina creekshell)	c.s,Sa,G,Co,bo			
<u>Lick Fork @ SR 1129</u>					
000609.3.jaj	Elliptio spp. (n/a)	c,S,Sa,G,co,bo,b	visual	2h	23
000609.3.jaj	Villosa delumbis (eastern creekshell)	c,S,Sa,G,co,bo,b	visual	2h	2
000609.3.jaj	Villosa vaughaniana (Carolina creekshell)	c,S,Sa,G,co,bo,b	visual	2h	3
<u>Little River @ SR 1340</u>					
990824.3.jma	Elliptio angustata (Carolina lance)	S, Sa, Co, B, p, g, r			
990824.3.jma	Elliptio complanata (eastern Elliptio)	S, Sa, Co, B, p, g, r			
990824.3.jma	Villosa constricta (notched rainbow)	S, Sa, Co, B, p, g, r			
990824.3.jma	Villosa delumbis (eastern creekshell)	S, Sa, Co, B, p, g, r			
<u>Little River @ SR 1554</u>					
990823.2.jma	Elliptio angustata (Carolina lance)	Sa, Co, bo, g, d	tactile/visual	2h	2
990823.2.jma	Elliptio complanata (eastern Elliptio)	Sa, Co, bo, g, d	tactile/visual	2h	64
990823.2.jma	Lampsilis cariosa (yellow lampmussel)	Sa, Co, bo, g, d	tactile/visual	2h	1
990823.2.jma	Lampsilis radiata conspicua (Carolina fatmucket)	Sa, Co, bo, g, d	tactile/visual	2h	3
990823.2.jma	Strophitus undulatus (creeper)	Sa, Co, bo, g, d	tactile/visual	2h	1
990823.2.jma	Unionerus sp. (n/a)	Sa, Co, bo, g, d	tactile/visual	2h	4
990823.2.jma	Villosa delumbis (eastern creekshell)	Sa, Co, bo, g, d	tactile/visual	2h	2
<u>Mountain Creek @ SR 1533</u>					
000609.2.jaj	Elliptio spp. (n/a)	c,S,Sa,g,bo	visual	1.16h	12
<u>Poison Fork @ SR 1306</u>					
000615.4.jaj	Elliptio spp. (n/a)	c.s,Sa,G,Co,b	visual	1.25h	5
<u>Rocky Creek @ SR 1543</u>					
990823.1.jma	Elliptio angustata (Carolina lance)	Co, B, G, sa, p, r	tactile/visual	2h	1
990823.1.jma	Elliptio complanata (eastern Elliptio)	Co, B, G, sa, p, r	tactile/visual	2h	13
990823.1.jma	Villosa delumbis (eastern creekshell)	Co, B, G, sa, p, r	tactile/visual	2h	1
<u>Town Creek @ SR 1542</u>					
990824.5.jma	Elliptio angustata (Carolina lance)	Sa, G, Co, s, c, p	tactile/visual	0.667h	1
990824.5.jma	Elliptio complanata (eastern Elliptio)	Sa, G, Co, s, c, p	tactile/visual	0.667h	3

Location	Site (date) and species	Substrate	Technique	Time	Search #	Live #	Shells
<u>Uwharrie River @ SR 1301</u>							
000601.3jai	Elliptio angustata (Carolina lance)	s,sa,g,Co,bo,b	visual	2.5h		4	
000601.3jai	Elliptio spp. (n/a)	s,sa,g,Co,bo,b	visual	2.5h		190	
000601.3jai	Lampsilis radiata (eastern lampmussel)	s,sa,g,Co,bo,b	visual	2.5h		1	
000601.3jai	Villosa vaghaniana (Carolina creekshell)	s,sa,g,Co,bo,b	visual	2.5h		1	
<u>W Fork Little River @ SR 1311</u>							
990824.2jma	Elliptio angustata (Carolina lance)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h		2	
990824.2jma	Elliptio complanata (eastern Elliptio)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h		13	
990824.2jma	Villosa constricta (notched rainbow)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h		4	
990824.2jma	Villosa delumbis (eastern creekshell)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h		2	
990824.2jma	Villosa vaghaniana (Carolina creekshell)	S, Sa, Co, Bo, b, p, g, d	tactile/visual	2h		1	
<u>Randolph County</u>							
<u>Little River @ SR 1127</u>							
990824.1jma	Alasmidonta varicosa (brook floater)	Sa, Co, Bo, s, p, g	tactile/visual	2h		3	
990824.1jma	Elliptio angustata (Carolina lance)	Sa, Co, Bo, s, p, g	tactile/visual	2h		1	
990824.1jma	Elliptio complanata (eastern Elliptio)	Sa, Co, Bo, s, p, g	tactile/visual	2h		44	
990824.1jma	Elliptio icerina (variable spike)	Sa, Co, Bo, s, p, g	tactile/visual	2h		1	
990824.1jma	Fusconaia masoni (Atlantic pigtoe)	Sa, Co, Bo, s, p, g	tactile/visual	2h		1	
990824.1jma	Strophitus undulatus (creeper)	Sa, Co, Bo, s, p, g	tactile/visual	2h		1	
990824.1jma	Unionerus sp. (n/a)	Sa, Co, Bo, s, p, g	tactile/visual	2h		1	
990824.1jma	Villosa constricta (notched rainbow)	Sa, Co, Bo, s, p, g	tactile/visual	2h		2	
990824.1jma	Villosa delumbis (eastern creekshell)	Sa, Co, Bo, s, p, g	tactile/visual	2h		1	
990824.1jma	Villosa vaghaniana (Carolina creekshell)	Sa, Co, Bo, s, p, g	tactile/visual	2h		3	
						7	

Table 4. Mussel species found in Montgomery County during previous aquatic inventories conducted by the NC Wildlife Resources Commission. See also reports from the Uwharrie Mountains Inventory, 1989-1994 (Alderman and McGrath 1994) and the Jones Lake State Park Aquatic Inventory, sites 970401.1gbm through 970401.4gbm (Mottesi 1997).

Location	Site (date) and species	Substrate	Technique	Search Time	# Live	# Shells
<u>Clarks Creek @ NC 73</u>						
	991025.3jma <i>Elliptio complanata</i> (eastern Elliptio)	s,sa,G,Co,Bo,b	visual	3h		17
<u>Denson's Creek @ NC 134</u>						
	951002.2jma <i>Alasmidonta varicosa</i> (brook floater)			1.58h		2
	951002.2jma <i>Elliptio</i> spp. (n/a)			1.58h		24
	951002.2jma <i>Lampsilis radiata</i> (eastern lampmussel)			1.58h		1
	951002.2jma <i>Strophitus undulatus</i> (creeper)			1.58h		1
	951002.2jma <i>Toxolasma pullus</i> (Savannah hiliput)			1.58h		7
	951002.2jma <i>Villosa delumbis</i> (eastern creekshell)			1.58h		8
	951002.2jma <i>Villosa vaughaniana</i> (Carolina creekshell)			1.58h		4
<u>Denson's Creek @ SR 1323</u>						
	970708.5jaj <i>Alasmidonta varicosa</i> (brook floater)	visual				
	970708.4jaj <i>Elliptio</i> spp. (n/a)	S,Sag,co,bo,b	visual	0.5h		
	970708.4jaj <i>Toxolasma pullus</i> (Savannah hiliput)	S,Sag,co,bo,b	visual	0.5h		2
	970708.5jaj <i>Toxolasma pullus</i> (Savannah hiliput)	visual			4	1
	970708.4jaj <i>Villosa constricta</i> (notched rainbow)	S,Sag,co,bo,b	visual	0.5h		
	970708.5jaj <i>Villosa delumbis</i> (eastern creekshell)	S,Sag,co,bo,b	visual	0.5h		2
	970708.4jaj <i>Villosa vaughaniana</i> (Carolina creekshell)	S,Sag,co,bo,b	visual	0.5h		12
<u>Lake Tillery @ SR 1110</u>						
	991025.1jma <i>Elliptio complanata</i> (eastern Elliptio)	visual				2
	991025.1jma <i>Lampsilis radiata</i> (eastern lampmussel)	visual			1	
	991025.1jma <i>Pyganodon cataracta</i> (eastern floater)	visual				2
	991025.1jma <i>Uterbackia imbecillis</i> (paper pondshell)	visual				
	991025.1jma <i>Villosa delumbis</i> (eastern creekshell)	visual				
<u>Little River @ n/a</u>						
	951003.2jma <i>Elliptio</i> spp. (n/a)					

Location	Site (date) and species	Substrate	Technique	Search Time	# Live # Shells
<u>Little River @ SR 1005</u>					
970709.1jaj	Elliptio angustata (Carolina lance)	r,s,sag,co,bo,b	visual		6
970709.2jaj	Elliptio angustata (Carolina lance)	r,s,sag,co,bo,b	visual		
970709.1jaj	Elliptio spp. (n/a)	r,s,sag,co,bo,b	visual		
970709.2jaj	Elliptio spp. (n/a)	r,s,sag,co,bo,b	visual		
970709.5jaj	Elliptio spp. (n/a)	r,s,sag,co,bo,b	visual		
970709.2jaj	Lampsilis cariosa (yellow lampmussel)	r,s,sag,co,bo,b	visual		
970709.1jaj	Lampsilis radiata (eastern lampmussel)	r,s,sag,co,bo,b	visual		
970709.2jaj	Lampsilis radiata (eastern lampmussel)	r,s,sag,co,bo,b	visual		
970709.1jaj	Pyganodon cataracta (eastern floater)	r,s,sag,co,bo,b	visual		
970709.2jaj	Pyganodon cataracta (eastern floater)	r,s,sag,co,bo,b	visual		
970709.2jaj	Uniormerus sp. (n/a)	r,s,sag,co,bo,b	visual		
970709.1jaj	Utterbackia imbecillis (paper pondshell)	r,s,sag,co,bo,b	visual		
970709.2jaj	Utterbackia imbecillis (paper pondshell)	r,s,sag,co,bo,b	visual		
970709.1jaj	Villosa delumbis (eastern creekshell)	r,s,sag,co,bo,b	visual		
970709.2jaj	Villosa delumbis (eastern creekshell)	r,s,sag,co,bo,b	visual		
970709.1jaj	Villosa vaghaniana (Carolina creekshell)	r,s,sag,co,bo,b	visual		
<u>Little River @ SR 1340</u>					
951003.4jma	Elliptio spp. (n/a)	1h	113		
951003.4jma	lanceolate Elliptio (lance)	1h	2		
951003.4jma	Villosa constricta (notched rainbow)	1h	4		
<u>W Fork Little River @ n/a</u>					
951003.3jma	Elliptio spp. (n/a)	0.75h	63		
951003.3jma	Lampsilis radiata (eastern lampmussel)	0.75h	1		
951003.3jma	Villosa constricta (notched rainbow)	0.75h	2		
<u>W Fork Little River @ SR 1311</u>					
951002.3jma	Elliptio spp. (n/a)	0.83h	16		

Location	Site (date) and species	Substrate	Technique	Search Time	# Live	# Shells
<u>W Fork Little River @ SR 1340</u>						
970708.2jaj	Alasmidonta varicosa (brook floater)	r,s,sag,co,bo,b	visual	1.5h	1	
970708.2jaj	Elliptio angustata (Carolina lancee)	r,s,sag,co,bo,b	visual	2h	4	
970708.3jaj	Elliptio angustata (Carolina lancee)	r,s,sag,co,bo,b	visual	1.5h	1	
951002.1jma	Elliptio spp. (n/a)	r,s,sag,co,bo,b	visual	1.5h	143	
970708.1jaj	Elliptio spp. (n/a)	r,s,sag,co,bo,b	visual	0.67h	135	
970708.2jaj	Elliptio spp. (n/a)	r,s,sag,co,bo,b	visual	2h	166	
951002.1jma	Toxolasma pullus (Savannah lilliput)	r,s,sag,co,bo,b	visual	1.5h	1	
951002.1jma	Villosa constricta (notched rainbow)	r,s,sag,co,bo,b	visual	1.5h	6	
970708.1jaj	Villosa constricta (notched rainbow)	r,s,sag,co,bo,b	visual	0.67h	1	
970708.2jaj	Villosa constricta (notched rainbow)	r,s,sag,co,bo,b	visual	2h	5	
970708.3jaj	Villosa constricta (notched rainbow)	r,s,sag,co,bo,b	visual	1.5h	3	
951002.1jma	Villosa delumbis (eastern creekshell)	r,s,sag,co,bo,b	visual	1.5h	8	
970708.2jaj	Villosa delumbis (eastern creekshell)	r,s,sag,co,bo,b	visual	2h	1	
970708.3jaj	Villosa delumbis (eastern creekshell)	r,s,sag,co,bo,b	visual	1.5h	1	
951002.1jma	Villosa vaughaniana (Carolina creekshell)	r,s,sag,co,bo,b	visual	1.5h	3	

Table 5. Freshwater fish species collected during the Montgomery County aquatic inventory.

Aphredoderidae

Aphredoderus sayanus pirate perch

Catostomidae

Catostomus commersoni white sucker
Erimyzon oblongus creek chubsucker
Minytrema melanops spotted sucker
Moxostoma collapsum v-lip redhorse
Scartomyzon sp. brassy jumprock

Centrarchidae

Acantharchus pomotis mud sunfish
Chaenobryttus gulosus warmouth
Lepomis auritus redbreast sunfish
Lepomis cyanellus green sunfish
Lepomis gibbosus pumpkinseed sunfish
Lepomis macrochirus bluegill sunfish
Micropterus dolomieu smallmouth bass
Micropterus salmoides largemouth bass

Cyprinidae

Clinostomus funduloides rosyside dace
Cyprinella analostana satinfin shiner
Cyprinella pyrrhomelas fieryblack shiner
Hybopsis hypsinotus highback chub
Nocomis leptocephalus bluehead chub
Notemigonus crysoleucas golden shiner
Notropis altipinnis highfin shiner
Notropis chiliticus redlip shiner
Notropis cummingsae dusky shiner
Notropis hudsonius spottail shiner
Notropis petersoni coastal shiner
Notropis scepticus sandbar shiner
Semotilus atromaculatus creek chub

Esocidae

Esox niger chain pickerel

Ictaluridae

Ameiurus brunneus snail bullhead
Ameiurus catus white catfish

Table 5 (cont.). Freshwater fish species collected during the Montgomery County aquatic inventory.

Ictaluridae (cont.)		
<i>Ameiurus natalis</i>		yellow bullhead
<i>Ameiurus nebulosus</i>		brown bullhead
<i>Ameiurus platycephalus</i>		flat bullhead
<i>Noturus insignis</i>		margined madtom
Percidae		
<i>Etheostoma flabellare</i>	<i>not verified but from Lumber, so probably OK</i>	fantail darter
<i>Etheostoma mariae</i>		pinewoods darter
<i>Etheostoma olmstedi</i>		tesselated darter
<i>Percina crassa</i>		piedmont darter
Poeciliidae		
<i>Gambusia holbrookii</i>		eastern mosquitofish

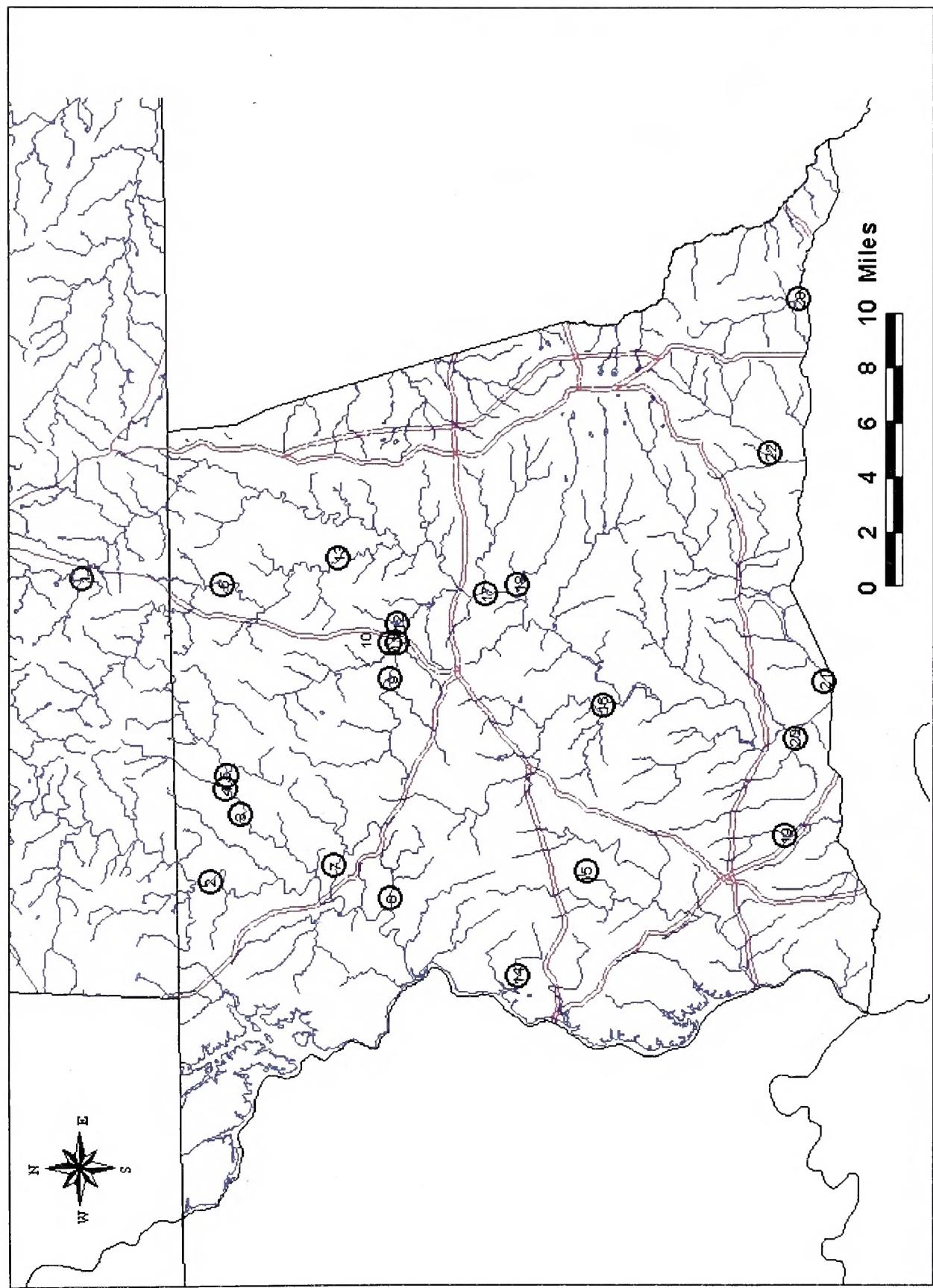


Figure 1. Sites surveyed during the aquatic inventory of Montgomery County, 1999-2000.

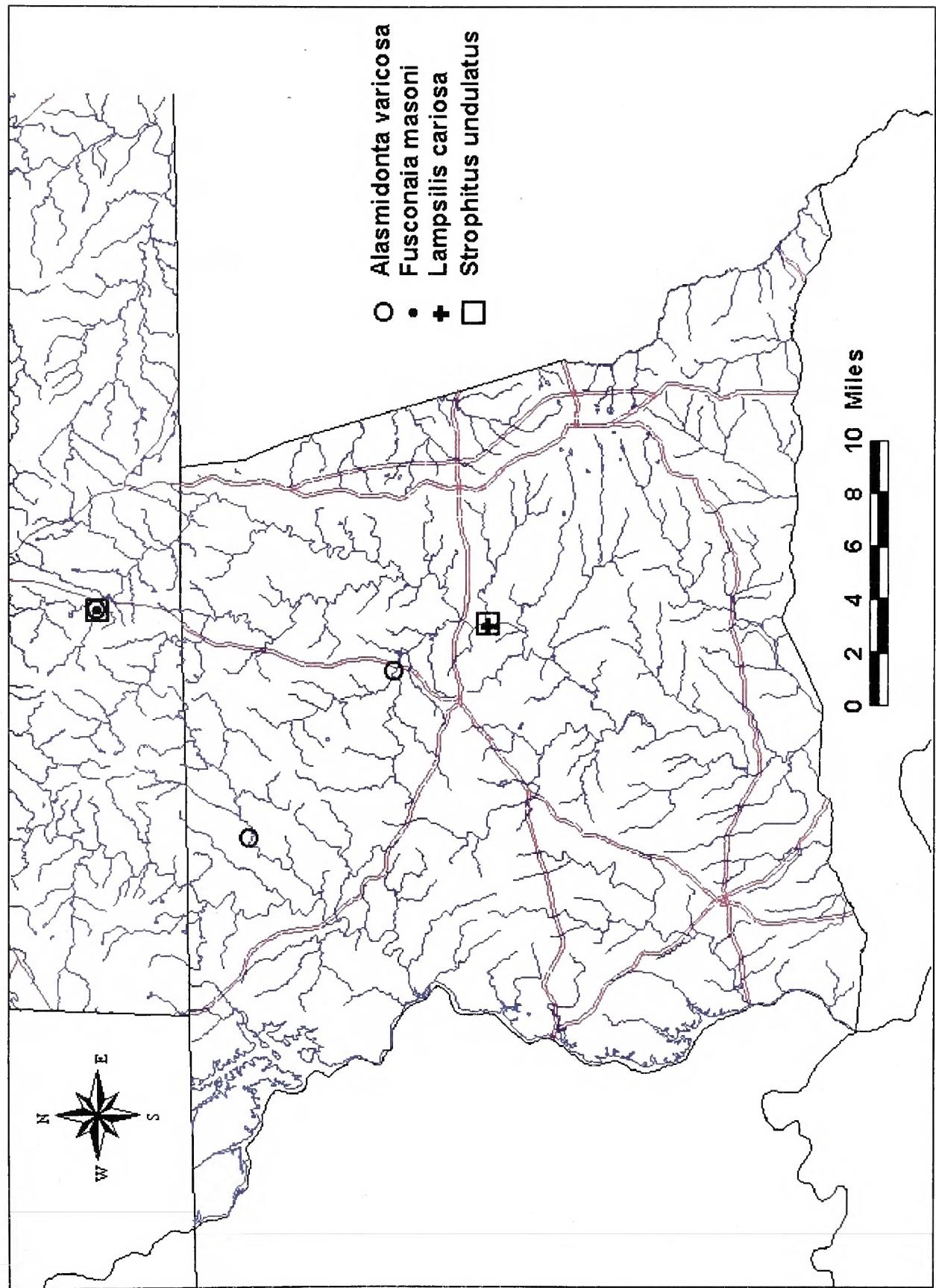


Figure 2. State-listed Threatened aquatic species occurrences documented in Montgomery County inventory, 1999-2000.

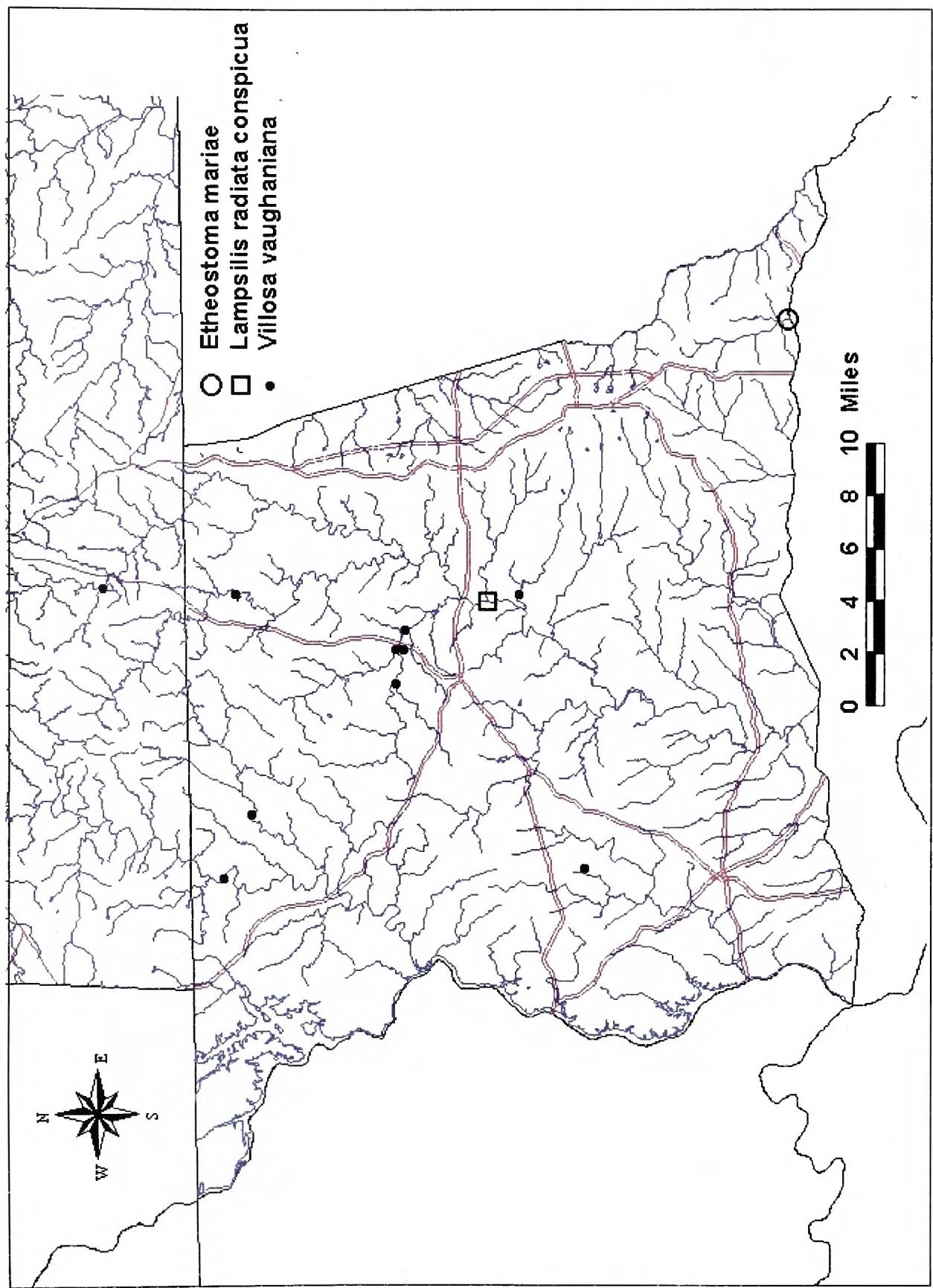


Figure 3. State-listed Special Concern aquatic species occurrences documented in Montgomery County inventory, 1999-2000.

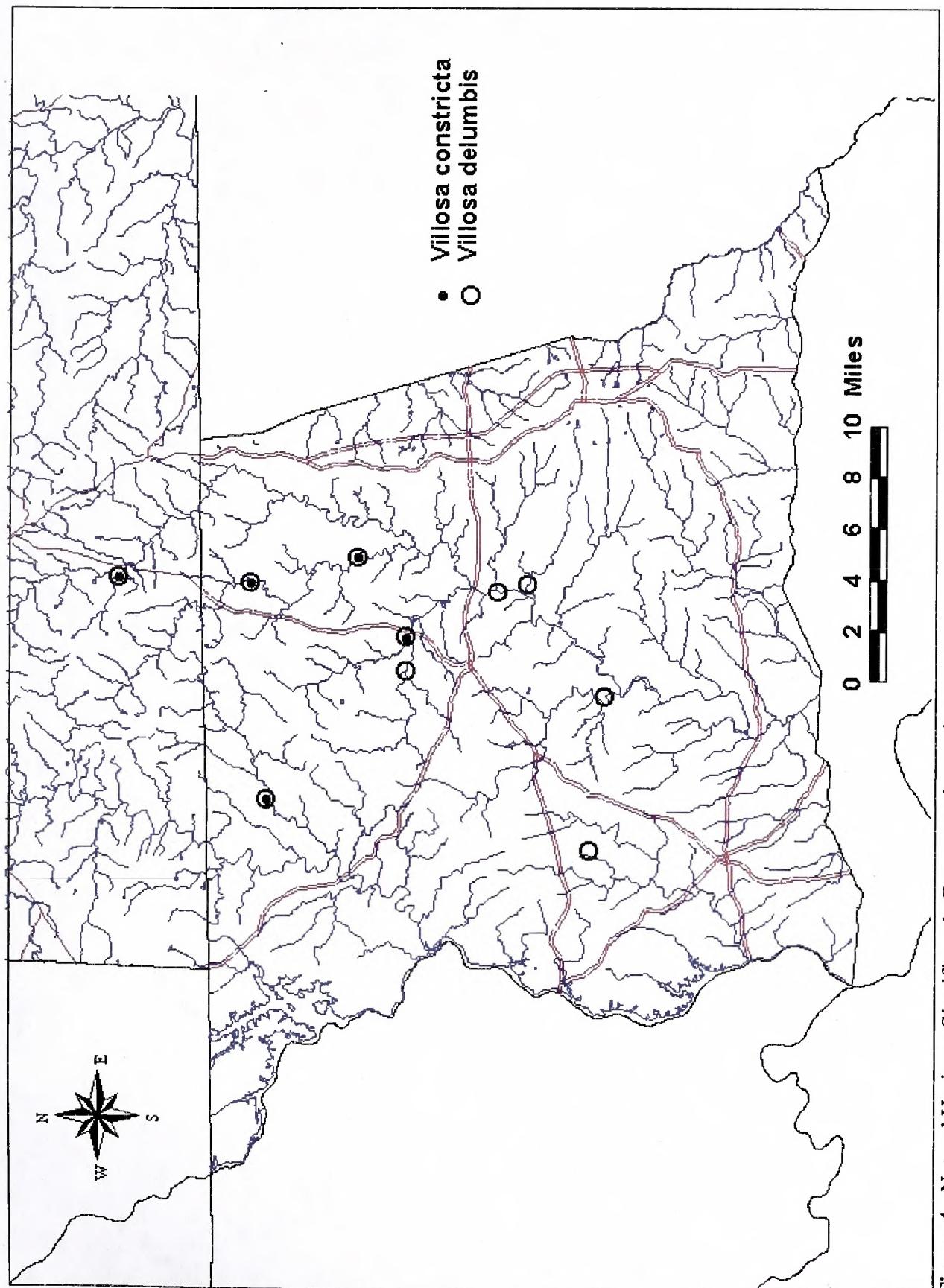


Figure 4. Natural Heritage Significantly Rare aquatic species occurrences documented in Montgomery County inventory, 1999-2000.

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